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Photo, A. O. Wheeler

MT. GOODSIR FROM GARNET MT.
Showing North and South Towers
(See Article by Dr. J. W. A. Hickson)

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VOL. VII. THE ALPINE CLUB OF CANADA.

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MOUNTAINEERING SECTION.

MT. TETRAGONA

A First Ascent in Labrador

By A. P. Coleman

The Torngat Mountains in Labrador are only 1,300 miles northeast of Toronto, but to reach them means a journey of nearly 4,000 miles. The Rockies, though much farther off, can be reached in less than a week of comfortable travel, but the Torngats had the irresistible charm of being almost unknown, so my steps were turned toward them last summer. The journey did not lack variety, for it meant travel by railways, steamships, motor boats, a schooner, and an Eskimo skiff before my point was reached, and it was forty days after my departure from Ontario when our skiff slipped into Komaktorvik fiord before a gentle east wind on the 4th of August. East wind on that coast means fog, and all the higher parts of the shores were hidden as we advanced, feeling our way along the black bases of cliffs and hearing the sound of invisible waterfalls. It seemed a mysterious land of shadows and I wondered what clear weather would disclose. The landing in the fog at the rocky end of the fiord where a large river came in did not seem inspiring to me, but my Eskimos were in high excitement, for seals were bobbing up all around. As soon as camp was set one of the men was after them in the Kayak, and that evening we had seal meat for dinner.

After a few days exploration, mostly in fog or with clouds hiding the mountain tops, and a climb of the

nearest peak, 3,000 feet high, where I got above the mists, it seemed advisable to move our camp five miles inland to a valley sheltered from the northeast winds and the masses of vapor which they piled up along the shores of the fiord.

Next morning the three of us set out with heavy packs through a wide valley with a fine mountain and a small glacier at its southern end. Noon found us encamped 1,000 feet above the sea and actually in sunshine. The camp ground, beside a little canyon through which a river roared, and a grand cliff a half mile off, was excellent but for the lack of wood. The largest trees were willows a few inches high. Cornelius solved the fuel problem, however, by gathering white heather *(Cassiope tetragona)* with which he managed to produce enough smudge to boil water for tea. This plant it seems will burn even when green.

I christened the near-by mountain Tetragona. It was a joy to bask in the sunshine now that we had left the chill fogs of the sea coast and, to add to the homelike feeling, swarms of black flies attacked us just as they would have done in a Rocky Mountain valley.

As the face of the mountain opposite was unpromising for climbing, I spent the afternoon wandering up the pass in search of a better place and succeeded in finding a lake a mile long surrounded on three sides by cliffs equally impossible. The outlook to the southwest was not good so, after supper, Cornelius showed me a way he had found for crossing the river in the canyon by jumping from rock to rock, and we explored in the opposite direction. From a hill we could see the cirque and glacier with steep walls behind it rising to the twin peaks of Tetragona, but beyond the mountain fell away toward a col which looked attackable. We decided on that route for the next day's climb.

The early morning of August 10th was cloudy and all the higher mountains were covered till 6.45 a.m. when the

Photo, A. P. Coleman

FIRST GLACIER, MT. TETRAGONA
Main Summit to Right

Photo, A. P. Coleman

SECOND GLACIER, MT. TETRAGONA

sun melted its way through the mists and we set off down the valley at a sharp pace so as to make up for lost time. We tramped over stony meadows with boggy places, just like parts of the Rockies above timberline but with scantier vegetation, rounded a bastion of Mt. Tetragona, getting a full view of the small glacier and snowfield, and crossed the stream coming from it on stepping stones. I managed to get my feet wet but Cornelius' sealskin boots kept him dry in spite of his shorter legs.

A mile more brought us to a second glacial stream, luckily bridged with snow, and this we crossed and followed up, climbing over rock ledges, each with a little strip of grass or moss on top. At one point my Eskimo pointed out a broad leaved sorrel and said "good." We helped ourselves to bunches of the sour leaves as we walked, and presently we rounded the foot of a cliff and reached the rim of a cirque with a blue-green lake and a second glacier rising above it. It looked attractive and if there had been three of us with a rope I should have taken that way up the mountain, but it was very steep and Cornelius' boots had no heels nor hobnails.

We turned off toward the col between Tetragona and the next peak to the north, and there could look down from about 2,000 feet upon the foggy sea. Then came a choice between a long snowslope and a bad looking stretch of loose stones beside it. I soon found that my companion was no good on snow at an angle of forty-five degrees, so we toiled painfully up over the stones, perpetually rolling beneath us, till solid rock was reached at 3,600 feet. Here melting snow provided a drink and we halted for our lunch of biscuit and Australian mutton. We were near the bergschrund of the second glacier and, looking over a cliff, could see the snowfield and then a crevassed surface reaching down into the cirque, followed by three tiny gem-like lakes. On the other side a sea of pearly cloud filled the valleys and billowed against the mountain sides. It was the

"silver lining" of the fog which had been so depressing on the shores of the fiord. Beyond the fog one could see the Atlantic, whitened by long swirls of floe ice coming down with the Arctic current.

After lunch the ridge narrowed to a ragged edge of loose blocks and, before long, it was cut up into gendarmes and pinnacles decidedly uncomfortable to negotiate, particularly so as one looked down over cliffs and the snowslopes of the first glacier on the northwest, and on a wall of gneiss followed by a curious sheet of steep ice almost free from snow on the southeast.

I decided to make my way down one or two hundred feet and work along a wall of gneiss which had a tilt of seventy or seventy-five degrees. Here narrow edges of the rock could be followed, occasionally stepping up or down to another level. The work was strenuous and sometimes dangerous, with the steep ice slope waiting below in case of a slip, and a quarter of a mile of it kept me busy for an hour. It was a relief when the ridge widened again and I could sit down and get my breath.

Cornelius had kept close to my footsteps along the ridge, but when I started along the face of the cliff he was left behind and I felt rather worried about his sealskin boots on the rocks. The worry was quite uncalled for and I could see him cautiously making his way across by a route of his own, the soft and flexible sealskin clinging to the gneiss quite as well as my worn hobnails. Before long he was sitting beside me and his narrow eyes brightened when I told him: "You good climber."

The rising crest of the ridge widened to about 300 yards and was covered for a quarter of a mile by a steep and dazzling snowfield, where Cornelius was slow and afraid of slipping. Then the ridge narrowed again to ten or twenty feet of big gneiss blocks, safe enough but hard to scramble over, and at length we found ourselves

on the highest point, though a second peak rose to nearly the same level beyond a break of a few hundred yards.

The top proved lower than I had expected, 4,700 feet by my best aneroid, and 200 feet higher by an older one, while I had estimated it at something over 5,000. Cornelius built a massive cairn, while I sketched in the topography and enjoyed the magnificent view over sea and land. There was still fog in the deep hollow of Komaktorvik fiord and the lower valleys, but the mountains were mostly free from cloud. On all sides except seawards stretched an almost unknown wilderness of mountains, domes or ridges or separate peaks, with many small snowfields and a number of cirque glaciers, none of them large. Thirty miles to the south could be seen the depression of Nakvak fiord, the finest on the coast, surrounded by mountains apparently higher than those at Komaktorvik.

Our immediate surroundings were impressive. The cirque of the largest glacier yawned beneath us to the northwest with cliffs fifteen hundred feet high enclosing the snowfield, followed by blue ice and an exquisitely colored lake. Lower down in the shadow of cliffs were two other small lakes. The second glacier was out of sight, but we looked down on the ice sheet to the southeast and a half frozen lake below it. The wild and ragged coastline of the Atlantic could be followed for many miles till lost in haze northwards toward Cape Chidley and southwards beyond Nakvak.

It was a wide and splendid view but it lacked one great element of beauty in the Rockies. There were no wooded slopes nor groves of evergreens in the valleys, since Komaktorvik in latitude 59 deg. 30 min., is north of the timberline, and we looked out upon one of the stoniest and most desolate regions in the world. I was reminded of the view from Mt. Nordenskjold in Spitzbergen, where, however, the glaciers are much larger.

The top was reached at noon and an hour later we turned back. I had a good glissade on the snowfield, but Cornelius came down cautiously. The crossing of the steep face of gneiss was quite as bad as in the morning, but after that we made good time and reached camp about 5 o'clock, well pleased with our conquest.

As Cornelius was striving to make tea over a smoky fire of white heather, Johannes came in heavily loaded and covered with blood. He had shot a caribou in the next valley and had brought home the skin and all the meat he could carry. Cornelius opened up the bundle, cut off some titbits of the meat and ate them, then offered me a share and was rather surprised at my refusal. My turn did not come till the next day when we had gone back to the fiord, where a few sticks of driftwood made it possible to have a gorgeous venison stew, the first fresh meat for almost a month except the fishy tasting seal shot on the day of our arrival.

My friends of the Alpine Club, with bright visions in their minds of splendid peaks in the Rockies reaching 10,000 feet or more, may wonder why a mountain of only 4,700 feet should be worth counting as a first ascent. It should be remembered that these peaks of the Torngats rise almost straight from the sea instead of from foothills 3,000 or 4,000 feet above sea level as the Rockies do, and they they are entirely above timber line. They are as rugged and often as difficult to climb as most mountains in the Rockies.

Tetragona is in a region hitherto unmapped and never visited by a white man so far as the records go, and it is several hundred feet higher than the highest point hitherto reached in Labrador, the next to it being Mt. Faunce near Nakvak, thirty miles to the south, which was climbed by Messrs. Delabarre and Adams in 1900. They made its elevation 4,400 feet.

Two weeks after our ascent of Tetragona we climbed three peaks in the Nakvak region, one going a little over

5,000 feet, and it is possible that a few mountains near by approach 6,000 feet, but I am doubtful if any go beyond that.

In altitude the Torngats cannot be compared with our western mountains, and until they are more easy of access it is not likely that many climbers will visit them, but there is a charm in their very remoteness and desolation that must attract the explorer. Virgin peaks, such as they are, may be counted by the dozen and there are many fine rock climbs, but the glaciers are too small to be of much importance to the mountaineer. The rocks are usually very sound, a great comfort where cliffs have to be scaled, and in this respect the Torngats have a great advantage over many of our western peaks, particularly in the Selkirks.

CLIMBS AND EXPLORATIONS IN THE PURCELL RANGE IN 1915

By W. E. Stone

In the summer of 1915 through the hospitality of Mr. and Mrs. A. H. MacCarthy there assembled at Karmax Ranch, near Wilmer, B.C., in the Upper Columbia Valley, a small party of mountaineers who, under the enthusiastic leadership of their hosts, engaged in two most interesting expeditions into the Purcell Range.

The beauty of the Upper Columbia Valley has been described more than once but never to exaggeration. For more than a hundred miles it lies enclosed between guardian mountain ranges, its sheltered, peaceful meadows and placid lakes contrasting with the vast wilderness surrounding them. To dwell in this smiling region and at the same time feel oneself in intimate touch with the splendid mountain ranges on its western border is a lot which every mountaineer might envy and of which our hosts have shown themselves highly appreciative.

The original possessors of this country were the Kootenai Indians, who now linger a mere remnant within the prosaic boundaries of a government reservation. Some of the earliest explorers visited the valley and even pushed on over the more accessible mountain passes; in recent years settlers have entered the region attracted by its fertility and climate; miners have prospected the foothills; trappers and hunters have plied their vocations; but mountaineers discovered it only a few years since and as yet have scarcely penetrated into the labyrinth of valleys or trod more than a few of its multitude of peaks. Thus a great alpine region remains practically unexplored and unknown. A reconnaissance

at the head waters of Bugaboo Creek, expeditions up Toby Creek to Wells Pass, and the partial exploration of the region at the head of Horse Thief Creek and its South Fork constitute all of the recorded efforts to explore this section. Of the vast array of peaks to be seen from any high station, barely half a dozen have been climbed. It might, therefore, be expected that the account of our two expeditions should describe new country and record the ascent of virgin peaks.*

I. Mt. Ethelbert and the Region on the South Fork of the Salmon River

From the neighborhood of Spillimacheen, about fifty miles south of Golden, the traveler on the general purpose train which semi-weekly, and with great deliberation, proceeds up the valley, may observe a conspicuous snow-crowned peak visibly overtopping its neighbors on the western horizon. Upon it in 1886 was bestowed the name of Ethelbert by Captain Armstrong of the Columbia River steamer Ptarmigan, in memory of a nun who died on his vessel. The mountain is the apex of a ridge extending toward the Columbia Valley at right angles to the main range and enclosed on the north and south by forks of the Salmon River. The region at the headwaters of these streams is practically unknown save to occasional trappers who have penetrated the valleys and there is no record of any attempt at its exploration, although

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*The records of mountaineering in the Southern Selkirks will be found in the following named articles:

Across the Purcell Range of British Columbia. T. G. Longstaff, Canadian Alpine Journal, 1911, page 26.

First Ascent of Mt. Hammond. C. D. Ellis, same, p. 14.

The Upper Columbia. Elizabeth Parker, same, p. 147.

First Ascents in the Southern Selkirks. Edward W. Harnden, Canadian Alpine Journal, 1912, p. 98.

Climbs in the Southern Selkirks. Edward W. Harnden, Appalachia, vol. XII., 1912, p. 350.

Exploration in the Southern Selkirks. Edward W. Harnden, Canadian Alpine Journal, 1914, p. 103.

First Ascents of Mt. Farnham and Mt. Farnham Tower. A. H. MacCarthy, Canadian Alpine Journal, 1914, p. 112.

Pioneering in the Southern Selkirks. Marion Randall Parsons, Sierra Club Bulletin, vol. IV., January, 1915, p. 240.

there is a fugitive rumour of an unsuccessful expedition to the mountain a few years ago.

Setting out from Karmax Ranch on July 22nd for the purpose of visiting this region and hopeful of making the first ascent of Ethelbert, we made a day's journey down the valley on a primitive wagon road. The region through which we traveled is a bench of the valley composed of the debris deposited from the canyons which reach far back into the mountains, a rather desolate, burned over country reforested by a growth of Jack pine and dotted with many lakes. Towards the end of the day we found ourselves separated from the main valley by a rocky ridge known as Steamboat Mountain, and, turning aside between two blazed trees, came presently to two sedgy lakes and camped for the night. From our bivouac on Twin Lakes where we abandoned wagon transport, a pony trail (the old Golden Trail) leads westward one and one-half miles to Deep Lake, where the next day we established our base camp and for a week enjoyed the peculiar beauty of that solitary spot.

The lake is separated from the mountain range by wooded foothills beyond which the higher peaks rise and are mirrored in its clear waters. Save for the early morning cries of a family of loons, no sound disturbed the quiet of this lovely lake. An abundance of trout supplied our larder and but for the pestiferous yellow-jackets, who, on more than one occasion, routed us by their fiery onslaughts, there was nothing to mar the pleasure of the situation.

Deep Lake lies near the South Fork of the Salmon River and a preliminary reconnaissance indicated that the best route to Ethelbert lay up the valley in which this stream has its source, apparently near the foot of the mountain. On the morning of July 25th a party of six consisting of four men and two ladies, carrying on their backs supplies for four days, took advantage of the

old trail for a mile or two in its northward course from Deep Lake and then turning toward the mountains, followed the winding course of the stream up the valley. For a time the going was easy through open, level places between clumps of trees. We found a deserted prospector's camp with a long abandoned cache of rotting saddle and blankets and a rusty miner's pan, hinting vaguely at disappointed hopes or even a darker tragedy. A little farther a trapper's lean-to was the last trace of man's presence which we saw before passing into the narrow jaws of the valley where soon we were forced to clamber high above the boisterous stream in order to make way.

The day was hot; the steep slopes and rocky ridges were scattered with brush and fallen timber, and our slow progress was toilsome and disagreeable. From the stream, which was often dammed by the debris of avalanches, both sides of the valley rose in steep "slides" alternating with timbered slopes. At noonday some one ventured the guess that it would require about an hour more to round the last timber ridge and reach the camp at the foot of Ethelbert. In actual fact it took six hours of strenuous effort under conditions which became constantly more difficult and our bivouac was finally made in the darkening twilight.

The day's course lay westward along the north side of the valley except at the last when a great mass of broken tree trunks piled impassably across our way testified to the power of snowslides and forced us to the south side of the stream. Soon after we entered a thick stand of timber, underbrush, fallen trees and moss covered rocks, where a tumbling cataract descended from the south side of the valley, making a loud noise among the trees, falling without pause from its source which two days later we discovered in a desolate hanging valley. A passing shower had wet the underbrush, thus adding the final element of discomfort to our progress.

Then came the climax of the day. Emerging from the thick brush, we came with startling suddenness on a scene so dramatic and beautiful that for a moment our eyes could scarcely be trusted, while weariness and discomfort were quite forgotten. Before us lay a lake of exquisite blue color resting like a jewel in a setting between two rugged peaks, which mirrored in the clear water, rose abruptly thousands of feet on either hand like grim guardians of a lovely treasure. Beyond the lake the lifted eyes rested on a terrace stretched across the valley like a giant curtain eighteen hundred feet above the lake, down whose verdant slopes two gleaming cascades traced their foaming course and filled the whole amphitheatre with the sounds of falling water. Still farther and higher in the background, great snow crests appeared, inscrutably looking down upon us. No contrast could have been greater than that which this scene offered to the day's experiences. It was the kind of reward which the mountaineer so often wins and which is compensation for any toil or danger.

Soon our camp fire was burning on the north shore of the lake at the very foot of Ethelbert and in spite of weariness, it was late before eyes were closed to the beauty of that rare valley into which quiet stars looked down and where the falling waters made the only sound.

On the following morning we left camp for the ascent of Ethelbert at 5.45 o'clock. The weather was cloudy and the aneroid indicated an altitude of fifty-seven hundred and fifty feet at the lake side. Our course lay directly up from the lake over an open, grassy slide, where we surprised two antlered deer taking breakfast and willing to pause for several minutes while we made their acquaintance. The south face of Ethelbert which now confronted us is characterized by a long, forked couloir filled with snow which makes a conspicuous land mark and enabled us two weeks later to identify the peak when

seen from different high stations in the ranges to the south.

We crossed the lower end of this snow to the rocks on the west side, working up easy slopes and chimneys to a point near the fork of the couloir at an altitude of about nine thousand feet where the steepness of the rock face compelled us to traverse toward the couloir. The ropes now became necessary although all of the party were experienced climbers. Not caring to trust ourselves in the snow trough, we picked our way cautiously up the west side of the deep gully clinging to the rocks and for a half hour or so enjoyed some exciting situations, this being the most difficult part of the whole ascent. Arriving at the head of the west branch of the couloir, we found ourselves on the western arête which led by a steep slope over snow and smooth rock slabs to the summit where we arrived at eleven o'clock. The barometer indicated 10,450 feet and in the absence of all evidence to the contrary, we claimed it as a first ascent and built a substantial stone man containing the following names: Mr. and Mrs. A. H. MacCarthy, Mr. and Mrs. W. E. Stone, H. O. Frind and Conrad Kain.

Through occasional rifts in the clouds which enveloped the peak, we had tantalizing glimpses of the lower world but, although we remained two hours on the summit, the genius of the weather would not relent and we were obliged to forego a view which under other conditions would doubtless have been unusual. Conrad felt his way across the ridge to a second peak a few hundred yards to the north and reported it decidedly lower than the one on which we stood. This summit ridge falls away sharply on the east and northeast where through the clouds we could discern a glacier of considerable dimensions. The mountain descends steeply to the north and on this account as well as the general cloudiness, we could see nothing of the valley of the main branch of the Salmon.

At one o'clock we began the descent, retracing our steps only as far as the head of the couloir and then continuing straight down the west slope intending to explore the region lying to the left or south of the ridge above the terrace at the head of the valley. At about nine thousand feet we were well below the cloud strata and obtained excellent views of our surroundings. To the south and southwest a grand panorama of high peaks and vast snowfields was to be seen. Longstaff, looking in the same direction from a high station near Bugaboo Pass in 1910, says: "The great extent of the snowfields and the general altitude of the range was a surprise." The region which we saw was undoubtedly that at the head waters of Horse Thief Creek and confirmed our later impressions of that interesting section.

But close at hand at our very feet lay a scene of unusual interest and beauty. The snow ridge which yesterday we had seen above the terrace at the head of the valley, now resolved itself into a fine cirque of snow peaks clad with glaciers with a charming hanging valley dotted with varicolored lakes nestling at their feet. There were a half dozen of these peaks approximating, we judged, nine to ten thousand feet in altitude, arranged in a semi-circle about the head of the valley, and at the northern extremity of the group somewhat isolated but probably belonging to the range, were two other conspicuous mountains. Of these latter the one farthest to the west was marked by a peculiar snow cornice resembling a pair of wings. Longstaff mentions a "Septet Range" seen by him to the southwest from a point between the north and south forks of Bugaboo Creek. It is possible that he referred to the range upon which we were now looking, but this cannot be verified at this time.

A lively glissade brought us down to the park-like hanging valley where for two or three hours we lingered, charmed by the beauty of the situation. Here upon a lofty bench (7,650 feet altitude) were scattered a dozen

or more lakes ranging in size from a mere pool to a mile in length, of every variety of colour and aspect. One with deep indigo waters was enclosed by precipitous walls; others were bordered by grassy slopes; others bathed with their greenish waters the feet of descending glaciers. Little hillocks were crowned with larches; a brood of ptarmigan, unaccustomed to men, gave little heed to our presence; a humming-bird flitted past; and alpine flowers were abundant. We basked in the warm sunshine and surrendered ourselves to the spirit of the lovely place, unique in its setting and its peculiar beauty. The stern encircling mountain range seems to cherish this beauty spot in its sheltering arms, from which looking out to the eastward between the sentinel peaks, Ethelbert on the left and its unnamed counterpart on the opposite side of the valley, the eyes ranged down to the lake of our bivouac, followed the winding course of the stream to the end of the valley; then out across the broad plain of the Columbia to the far blue outlines of the Rockies. We lingered here to the last moment delighted with the beauty and novelty of the situation, impressed with the belief that we stood where man had not been before. Then, dropping down the face of the terrace, we reached our camp at six-thirty. Supper and the ceremony of retiring were enlivened by a hard rain storm, but we forgot all discomforts in the thoughts of the day's events.

Breaking camp at five-fifteen the next morning, we climbed out of the valley over the range to the south, where we had been told a "low pass" would be found. This imaginary topographical feature turned out to be a rock ridge over eight thousand feet in altitude, which we reached after a toilsome scramble over rocks and snow consuming five hours from the camp. Lunch was seasoned by a snow squall and at intervals during the day we enjoyed snow and rain alternately. From the summit of the ridge we looked into an unknown valley winding down to the southeast. Opposite us to the south

were several fine rock peaks which ought to prove interesting to some aspiring mountaineer in the future. No trail was in evidence and four hours of hard going through alders and fallen timber completed such mutilation of our suffering limbs as had been left undone in the scrambles of the last two days. Late in the afternoon we reached the trail in the valley of Creek No. 3 and, regardless of the flight of time, boiled tea and consumed all our food reserves. Eight miles farther over a fairly good trail brought us into camp at Deep Lake at seven o'clock where the cook's fried trout, flapjacks and hot coffee agreeably dispelled all reflections of the day's hardships.

This region about Ethelbert will repay more careful exploration. The description, the sketch map and photographs fail, of course, to give an adequate idea of its interest, which all members of our party agreed was equalled by few or none of the regions they had visited. In the absence of a trail up the south fork of the Salmon, it is not easily reached but the old Golden trail could be extended without difficulty to the head of the valley which could then be reached in two days from Lake Windermere with attractive camping grounds *en route*. Previous to our visit the region has been seen apparently by no one save an occasional trapper or prospector. Virgin peaks await conquerors and a new field for explorers offers its attractions. We refrained from bestowing names except to suggest for purposes of identification that the lake at the head of the valley be called Surprise Lake and the mountain opposite Ethelbert, its counterpart except in altitude, be called Mt. Horeb, in scriptural allusion to the stream of water which, seen from the lake below, appears to gush out of the solid rock high up on its face.

On the 29th we broke camp at Deep Lake and returned to Karmax Ranch.

Photo, W. E. Stone

MT. HOREB

From Northwest

Photo, W. E. Stone

MT. ETHELBERT

From the South

II. Climbs on the South Fork of Horse Thief Creek

The expedition up Horse Thief Creek left Wilmer on the morning of August 2nd, lunched at Starbird Ranch, now fire-swept and deserted, expended a lot of energy clearing the trail of fallen timber, transferred the packs from wagons to the ponies a mile or two beyond the junction of the North Fork, and made a night camp about a mile farther up the creek on a gravel flat a little distance below the junction of the South Fork. At this point the valley becomes narrower and the mountains higher and more threatening. A fine waterfall plunging over the cliffs on the opposite side of the creek and the prominent snow peak far up the valley were the noticeable features of our camping place, while all day we had been impressed by the force and volume of the stream whose turbid current gave strong evidence of its mighty sources.

We were awakened the next morning by rain and thunder, a not very favorable portent, which fully sustained its prophecy before the day was over. A ubiquitous filly, offspring of the bell mare of the pack train, had received a deep cut on the breast while struggling through fallen timber the day before and a surgical operation became the first business of the morning. The little animal was hobbled and thrown and received eight stitches at the hands of Mrs. MacCarthy, who thus achieved the standing of veterinarian in addition to other accomplishments. Bill, the Indian packer, surveyed his property and laconically commented, "He learn, be pack pony."

After breakfast four of us were sent ahead with our packs and instructions to locate a camp at the farthest limit of pony transport up the valley of the South Fork, the pack train to follow later. The trail which we followed soon branched off near the crossing of the main creek, led sharply uphill and, after a couple of miles, brought us to an interesting box canyon in the depths

of which the waters of the South Fork almost entirely disappeared from view. At the very head of the canyon is a fine waterfall and the two slender logs bridging the creek at this point seemed a slight safeguard against disaster as we teetered across step by step. To lose balance on this slender bridge would precipitate one into the flooded stream to be drawn into the canyon in an instant. We forgot our own danger, however, in conjecture as to how the pack ponies could pass this point, the stream being too swift and deep for fording. It was found necessary when they arrived later in the day to reconstruct the bridge, which delayed their appearance at camp until late in the afternoon.

From this point on the valley became less steep and more open, with charming vistas through the mountains on both sides. As we came out of the forest across the foot of one of the grassy slides which occur at frequent intervals, we surprised five elk feeding at a little distance up the mountain side and enjoyed the splendid sight for several moments before they took fright and fled. A little farther on we sighted the flagstaff used by Mr. Harnden in his triangulation work in 1913 and nearby found his last year's camp. Flood conditions existed in the valley; frequently the trail was converted into a water course and some of the time it rained, so that we were thoroughly wet most of the day. Finally the trail lost itself in the gravel flats, the valley narrowed to a wooded canyon impassable for horses and we concluded that we had carried out our instructions.

The camp site was located in a fringe of timber just below a fork in the creek where we found traces of former occupancy. Opposite rose Sir Charles and St. Peter and through the gaps between and beyond them could be seen Farnham and Delphine. The centre of attention, however, was the great glacier heading the valley to the southwest. Ten minutes from camp brought us to the

Commander Pk. Jumbo Peaks

Photo, W. E. Stone COMMANDER GLACIER FROM SUMMIT OF ST. PETER

curiously marked snout which in the photographs resembles a huge claw reaching down into the valley. The glacier itself leads by a series of terraces and slopes to the skyline, broken by two or three curious small conical peaks, while to the right appears a massive mountain peak with rounded crest and precipitous walls. We somehow got the impression that this was Jumbo Peak, although we could not reconcile it with the map or with any of the published photographs. Later we learned that the Jumbo Peaks are not visible from this valley or from the basin of Lake Maye on the west side of the range. The aneroid at camp indicated an altitude of 5,650 feet. The rain kept up far into the night but the following morning and all of the remaining days of our stay were perfect in weather conditions.

To climb the peak noticed at the western boundary of the glacier was the object of our first day's effort. Warned by the experience of Harnden's party in 1913 in crossing the icefield, we selected a course up the north or left lateral moraine of the glacier with the intention of climbing into the saddle shown in the photograph to the right of the main peak, and then following the rock and snow arête to the left up to the summit. At the end of the moraine we crossed a small branch of the main glacier and attacked the steep rock face of the saddle. Unexpected difficulties developed on account of the steepness and smoothness of the cliff. We headed for a snow gully leading up on the left but found it impassable and were obliged to traverse toward the right over a difficult corner. Falling rocks were a constant danger, one formidable missile whizzing through the air close to us, clearing the whole slope at one bound and burying itself in the snow far below.

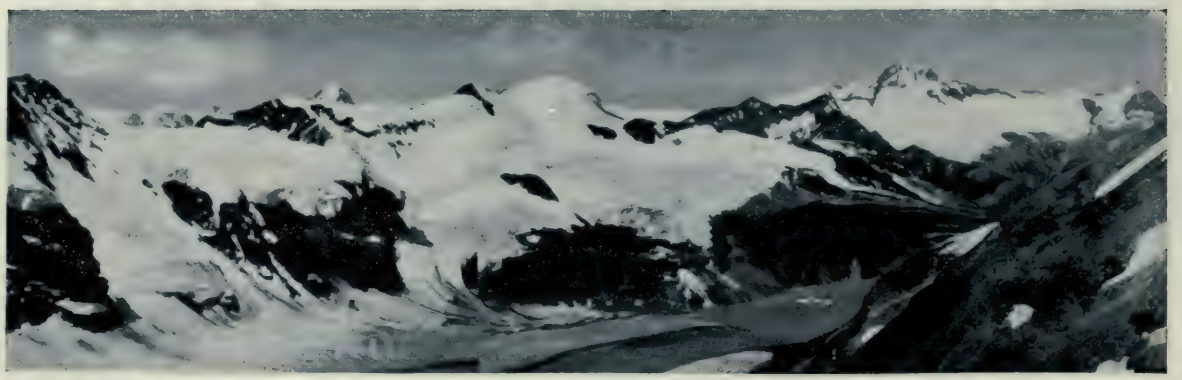
When at last we stood on the sharp ridge of the saddle an entirely new scene burst upon our gaze. We were looking to the westward. Immediately on the left, high cliffs extended across the valley topped by a hanging

glacier; beyond, jagged peaks with snow and ice fields made a long sweep to the north ending in a high peak which we recognized as Eyebrow Mountain; and at our feet a splendid piedmont glacier with a long, plainly marked medial moraine, sloped gradually down into a lake which we identified as Lake Maye. We were, in fact, standing upon the divide between the headwaters of the South Fork and the Main Fork of Horse Thief Creek.

We now made our way easily up a narrow rock arête to the left to the snow line, where, six hours from camp, we stopped for lunch. Looking up the snow slope ahead of us, the summit of the peak was concealed from sight, but, as we proceeded, a fine sharp peak emerged to view toward the southwest across an extensive snow field. Climbing was not difficult, requiring only care to avoid crevasses and possible avalanches, the snow being still soft. At the top of the ridge, we saw the real summit farther along toward the south, which we reached soon after three o'clock, the barometer showing an altitude of 10,950 feet. We built a cairn on the rocks although the snow cornice overtopped this by some ten feet, leaving a record of the climb and the climbers, namely, Mr. and Mrs. A. H. MacCarthy, Mr. and Mrs. W. E. Stone, Miss B. Schultz, H. O. Frind and Conrad Kain. The view in all directions was superb. To the east Farnham, Sir Charles, St. Peter, Delphine, Boulder, Nelson seemed all within arm's reach. Far beyond all of the well known land marks of the Rockies were recognized. To the north Ethelbert was conspicuous. Westward was a confused array of unknown but grand mountains.

Looking across a snowfield of a mile or so toward the southwest, we saw two peaks which we identified as the Jumbo Peaks of Harnden's description, the westerly of which had been in view for some time. Now we realized that the mountain on which we stood was not only a virgin peak but not even christened, a deficiency which we supplied later. It was late in the afternoon but

Lake Maye Eyebrow Mt.



Photo, H. O. Frind

FROM COMMANDER RIDGE
Looking West and Northwest

weather conditions being favorable, we decided to push on to at least the first of the Jumbos. A glissade down the steep western slope of our peak soon placed us on the snowfield which by a smooth and not difficult slope led up to the gracefully corniced summit of the main Jumbo Peak, which we reached at five o'clock, all of those mentioned above participating. There was no opportunity to build a cairn here on account of the depth of the snow. The barometer indicated 11,125 feet. It was too late to attempt the ascent of the twin peak which lay still some distance to the west and which on account of its remoteness from any suitable camping place will be reached only after a long and strenuous effort. We had a splendid view from this point which, with the exception of Eyebrow Mountain, is, perhaps, the highest in the range. Many fine peaks to the far west showed that there still remain in this region splendid entertainment for mountaineers. We left the summit at 5.30, choosing a course over the pass between Jumbo and the mountain first ascended, down across the glacier where we had some difficulty in threading our way through a labyrinth of crevasses, reaching camp without mishap at 8.30, elated with the success of the day which had won for us two splendid mountains and a view of the vast unknown region to the west.

The glacier descending into the valley of the South Fork lies in a great depression on the northeast side of the range and evidently has little or no connection with the Jumbo Peaks. The large snowfield lying at the foot of the latter drains away toward Lake Maye and the Main Fork of Horse Thief Creek. It is doubtful if any appreciable amount of the true Jumbo névé reaches the South Fork. The mountain which we first ascended dominates the South Fork Glacier, bounding it on the west and along the south is a high ridge marked by three small conical peaks; between them a narrow pass connects with the Jumbo névé. Later the fine view of the

entire massif from the summit of St. Peter confirmed the conviction that the glacier and its boundaries are separate from the Jumbo Peaks and the glacier at the head of Lake Maye. The fancied resemblance of the mountain and the lesser peaks to a military formation suggested for them the names of Commander and the Three Guardsmen, and Commander Glacier for the great icefield below them.

The foreshortened slopes of St. Peter culminating in a turreted peak of architectural aspect, rose opposite our camp on the east side of the valley and seemed to offer just the program for the day following the ascents of Commander and Jumbo. Bill, the Indian, out of consideration for our feelings, felled a big fir tree across the creek and we passed over dry shod, but during the day the rising waters carried away our bridge and on our return in the evening we were forced to wade the stream. Crossing a little meadow where the grasses were crisp with frost, we pressed up through the timber near a fine clear stream, coming down from the valley, over which the summit of Delphine could be seen. A game trail assisted not a little in getting through the timber and in a little while we came out into a fine open grove of larches which gradually yielded to dwarfed pines at the edge of timber line. Just beyond we encountered a nanny goat and her kid who did not delay seeking safer quarters in the direction of Mt. Farnham.

A considerable portion of the western slope of St. Peter is covered with loose shale-like slabs which reminded us of the fossil beds on Mt. Stephen. Interspersed were fragments of quartz and we picked up some fine cubical crystals of pyrites. Above this are strata of more enduring rock which give to the upper part of the mountain a characteristic castellated appearance. It was noon before we reached this point (altitude 9,250 feet), where the real climbing was to begin, so we halted for lunch, melting snow for drinking water, for St. Peter is

distinctly a "dry" mountain. At 1.30 we put on the ropes and started up through a chimney where we found plenty of loose stones but otherwise not difficult climbing. Coming out on the skyline as seen from the valley, we found the upper part of the mountain to consist of a concave slope steeply inclined to the northwest and covered with snow so as to be impassable. The only approach to the summit was therefore along the arête above the western cliffs which was accomplished without special difficulty, reaching the top at 2.45 p.m., the altitude being 10,750 feet.

The weather was exceptionally clear and we enjoyed fine views in every direction. Close at hand was Farnham with its terrifying precipices quite confirming all estimates as to its difficulty. To the southeast Delphine and a long ridge extending from it to the southwest lay in beautiful detail. We were struck by the interesting appearance of two other peaks on this ridge, one a fine rock tower, and examined them with more than usual interest with reference to the morrow's climb. To the southwest the Commander Glacier with its encircling heights and in the distance the Jumbo Peaks lay spread out before us with map-like clearness, while to the north Ethelbert was seen with great distinctness. We claimed this as a first ascent and a cairn was built in which we placed the names of our party: Mr. and Mrs. MacCarthy, Miss B. Schultz, W. E. Stone and Conrad Kain. The mildness of the day permitted us to linger and the beauty of the outlook claimed our attention until 4.30 p.m., when we began the descent, reaching camp leisurely at the fall of darkness.

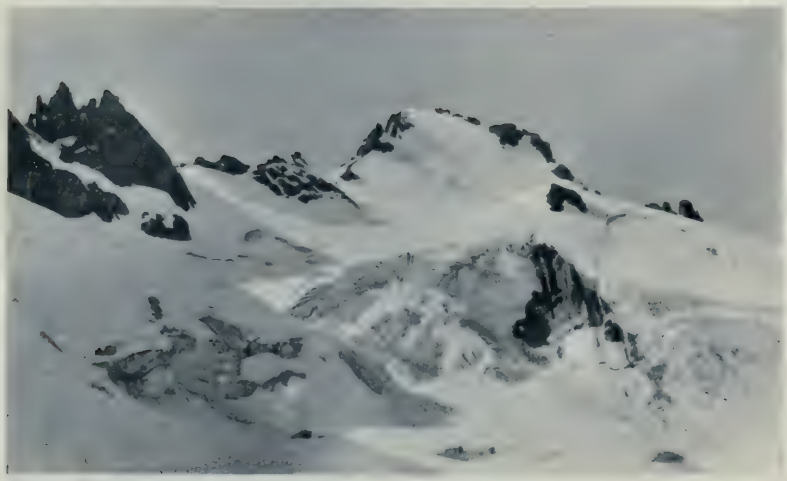
On the following morning, August 6th, the weather conditions being still exceptionally fine, we set out with the expectation of making a long day on Delphine, whose snowy summit lighted by the last rays of the setting sun was always a lovely contrast to the dark spruce-clad gap through which we saw it every evening. Following up

the clear creek which we noticed on yesterday's climb, we came after about an hour into an enclosed valley bounded on the north by St. Peter and on the east and south by the Delphine ridge. This valley, devoid of vegetation, its altitude 7,500 feet, proved to be of more than usual interest. The floor was covered with glacial debris which seemed to have been deposited from various directions, one deposit overlapping the other in broad, swirling, plastic fields.

At the head of the valley Delphine appeared as a fine, massive, pyramidal peak, its steep snow slopes broken here and there with bare precipices. The long ridge extending from it toward the southwest again attracted our attention. Midway in its course the fine rock tower noted from St. Peter rose a sheer perpendicular cliff a thousand feet from the glacier, its front marked with horizontal bands, its symmetrical profile culminating in a sharp point like the head of a spear or lance.

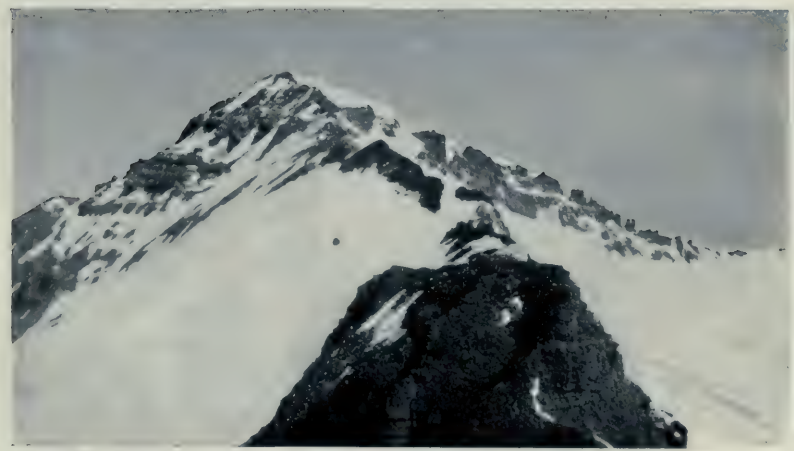
At the southern extremity of the range, a beautiful snow peak discharged its glacier into the valley where we stood. This glacier, owing perhaps to the topography of the slope or possibly to the eddying effects of the winds in the great amphitheatre, was pitted in many places with depressions, which filled with brilliantly colored pools of water, gave to the whole an effect resembling that of the "eyes" or jewels in a spreading peacock's tail. We thought it fitting, therefore, to suggest the name of Peacock for the mountain and the glacier, and for the tower-like rock peak the name of Spearhead.

Crossing the glacier, where the recent trail of a bear was visible, we made for a flanking buttress extending to the northwest at right angles to the main ridge. This buttress leads directly up to the last minor elevation on the main ridge before coming to the real arête of Delphine. A sharp scramble up a chimney filled with loose stones placed us on the roof of the buttress, whence



Photo, H. O. Frind

MT. PEACOCK AND PEACOCK GLACIER



Photo, W. E. Stone

LOOKING UP S. W. ARETE OF MT. DELPHINE

we went straight up rock and snow slopes to the summit of the ridge at eleven o'clock, the barometer reading 10,400 feet. Looking to the northeastward to the summit of Delphine, the ridge and final arête presented a far more difficult appearance than when seen in profile. Deep clefts, gendarmes, and snow cornices were obstacles which gave us more than an hour of active work to reach the summit, and reminded us vividly of the summit of Mt. Victoria. It was 12.15, six and three-quarter hours from camp when we reached the summit, altitude 10,975 feet.

Delphine peak is not only the highest point in this ridge but it marks an angle from which two wings diverge, one extending to the east and the other to the southwest. The summit is heavily corniced with an overhang to the east and south, preventing an outlook in that direction. We found here no evidence of any previous ascent and constructed our cairn on the rock ridge at the northwest point of the cornice, leaving in it the record of the climb with the names of Mr. and Mrs. MacCarthy, W. E. Stone, H. O. Frind and Conrad Kain. The writer has since been informed that Mr. A. A. McCoubrey, of Winnipeg, and Edward Feuz, Jr., the well known Swiss guide, going in by way of McDonald Creek, ascended the northeast side of the mountain and left a cairn in 1914. That this was not found by our party may possibly be accounted for by its being buried in the snow or it may have been set up on the ridge to the eastward on the opposite side of the snow capping cornice from our position and thus escaped our notice.

The fine clear weather was favorable to observations and photographs but too cool to make a long stay enjoyable. Furthermore, we had now conceived the plan for a complete traverse of the southwest ridge, including ascents of the two peaks, Spearhead and Peacock, and the hour, 1.10 p.m., left none too much time for this undertaking.

Retracing our steps along the ridge to the point of our initial ascent, we continued to follow the sky line, crossing two elevations of over 10,000 feet alternating with snow gullies, to the foot of Spearhead, which, seen in narrow profile, looked anything but inviting. On either side the cliffs fell away precipitously. In many places one could easily sit astride with feet hanging off into space on either side. The character of the rock was very bad and, as we realized, no one had been before us to throw down the loose stones. The conformation of the ridge left us no choice but to go over all of the high points. It was impossible to make any lateral traverses and oftentimes the only resting points on the ridge consisted of balanced rocks. On this account every foot of the climb had to be carefully negotiated, requiring the utmost caution and steadiness. At 2.55 p.m. we reached the highest point of Spearhead at an altitude of 10,500 feet and left here a monument and the record of our names.

Some discussion arose among the party as to whether this should be regarded as a separate peak or not. Conrad decided the matter by saying: "This is a real mountain," pointing out to us its altitude above the ridge, its peculiar conformation and more particularly the topography of the region to the south, where the peak dominates a considerable snowfield and glacier descending into the valley with a lake of peculiar form, which we named Shamrock. This lake, which was quite covered with ice, is the source of a stream which is doubtless a tributary of the North Fork of Toby Creek. One looking up this stream would observe a watershed and glacier hemmed in by an encircling ridge, of which Spearhead Peak is the climax.

Continuing our course over the southwestern arête of the peak, we found the whole slope of the ridge descending rapidly by a series of abrupt benches. On this part of the traverse we continually faced new problems.

In one place it was necessary to lower down with the rope each member of the party singly for a considerable distance. Scarcely was this difficulty overcome when we encountered a genuine Chamonix letterbox, or, as one of the party named it, a "straddle crack," consisting of a perpendicular cleft in the rock, transverse to the ridge, which it was impossible to avoid and down which we had to pick our way by standing astride the opening and using hand holds and steps on alternate sides of the cleft, gradually lowering ourselves to the bottom. At 5.30 p.m. we reached the lowest point in the entire ridge, the barometer indicating an altitude of 9,750 feet.

We now faced the northeast arête of Peacock with nearly a thousand feet to climb and a survey of the ridge ahead told us that it would be no easy task. Moreover, it was certain we could not return by any part of the route of ascent, while beyond the summit all was unknown. We had now been climbing twelve hours, of which more than half had been spent above 10,000 feet and much of the time our strength and skill had been under test. But now we nerved ourselves for the fastest and hardest work of the day. Halfway up the arête we encountered the most difficult passage of the entire climb, a narrow icy couloir at the head of a steep ice slope with perpendicular sides of smooth rock and scarcely room to wield the ice axe in cutting steps. It required nearly an hour to negotiate this brief crossing of a few feet. Beyond it was easy going up a snow slope to the last peak of the day, which was reached at seven o'clock, finding an altitude of 10,525 feet.

We remained here just long enough to take observations, hastily built a cairn leaving the record and our names, and to pick out a route for the descent. Fortunately an easy slope to the south brought us to the head of a long snow-filled valley down which a glissade brought us at tremendous speed and some damage to our clothing, which already had suffered quite as far as

respectability could approve, in the strenuous exertions of the day. In an hour we descended over 4,500 feet, reaching the valley of the South Fork about a mile above camp. By this time it was beginning to be dark and there remained only the unromantic task of wading the creek, floundering through bogs, climbing over fallen timber, until the gleam of our camp fire welcomed us, ending a day's mountaineering full of achievement, of unusual experience and pleasure.

The Delphine range furnished the climax of our climbs on the South Fork, combining a variety of problems, an extent of territory, and a degree of novelty rarely met in a single day. Next to Farnham it is undoubtedly the most interesting and difficult ascent or series of ascents in the region.

We were now content to enjoy a day's rest, having in three successive days accomplished six first class ascents, five of which were of virgin peaks. We regretted the lack of time to explore the glacier at the head of the valley in which the South Fork takes its rise. Mr. MacCarthy climbed one of the foothills to obtain a distant view and found it of no small extent. Its altitude is much lower than that of Commander Glacier, while its conformation and location strengthens the conviction that it is fed by drifting snows from the surrounding ranges rather than by actual precipitation.

On August 8th camp was broken, the writer and Mrs. Stone regretfully leaving the party, which camped a few days on the main creek, climbing Monica, Eyebrow and a virgin peak near the latter, named Birthday Peak in honor of Conrad's natal day. Sally Serena and two or three neighboring peaks were also climbed, the party being favored with good weather and composed of an unusually able personnel.

EXPERIENCES IN THE CANADIAN ROCKIES IN 1915

By J. W. A. Hickson

It was with but little expectation of being able to come to grips once more with the mountains that the writer looked forward to a vacation last summer. He had been done out of a season of mountaineering the previous year, through the outbreak of the European war which obliged him to make a hurried departure from Cortina in the Austrian Tyrol after a couple of minor rock climbs, which were to serve as preliminary training to a campaign in the Dolomites and Switzerland. He had pretty well resigned himself to the necessity of putting aside all mountaineering plans until after the present crisis of affairs, when a fortunate conjunction of circumstances enabled him to start westwards at the end of July, and the beginning of August saw him at Calgary looking with hopeful anticipations at the "old Rockies."

On the average, August is a month of uncertain weather in that part of Canada; or, perhaps, it would be more correct to say that from ten days to a fortnight of the month is usually impossible climbing weather. Fortunately for one who could not choose the time of his holiday, the bad weather had occurred in July—usually the best climbing month—and thereafter it continued almost uniformly excellent until the first week of September. The shortening of the day, however, after the middle of August is a considerable handicap on long climbs, which owing to the lack of huts or shelters

in the Canadian Rockies are frequently unavoidable. This factor caused us an unpleasant experience on one of our climbs.

Preliminary Climbs

I reached Field on August 9th, and on the following day walked with Ernest Feuz into the Little Yoho via the Takakkaw Falls and the Upper Trail, which, as all know who have been over this route, affords the most charming panoramic views of peak, forest, glacier and alp. We camped on the admirable site of the A.C.C. Camp of 1914, which to those who are not acquainted with it, may be recommended as one of the best centres for a number of delightful and easy climbs, and took some exercise next day by climbing the President over the Rock Ridge. This affords quite sufficient work for an initial climb. In a couple of places it is not altogether simple. Reaching the summit a few minutes after 9 o'clock, we spent an hour of peaceful beauty, enjoying the wide impressions and the vast and harmonious visions of the scene; and then, traversing the top ridge which was covered with deep snow, descended on the right over snow and loose rock to Emerald Pass. Thoughts of trying Mount Marpole on the way were fortunately put aside; and instead we hastened down the snowfield and across the much crevassed Emerald Glacier. The snow and ice were left behind about noon, and then followed a tedious descent over scree, shale, boulders, and again over more of each to Emerald Creek. The absence of any trail along the stream makes the couple of miles of descent here very wearisome for those who are not in good condition. The flats at the end of the Lake were reached about 3.30, and half an hour later we were refreshing ourselves with excellent tea at the charmingly situated and admirably conducted Chalet.

On the 13th of August, my most constant climbing companion and guide in the Rockies, Edward Feuz,

joined me, and on the following day my brother-in-law, C. B. Waagen, turned up from Calgary, and the trio ascended Mount Stephen, which the writer had climbed ten years before, from the direction of Lake O'Hara. Tedious as part of the ascent is, and trying as most of the descent is, Mount Stephen almost repays you on account of the superb views which clear weather on its summit affords. Our party was specially favoured after what looked like a threatening morning, and we had the great joy of basking in the glorious sunshine and gazing at some of the big peaks—Hungabee, Deltaform, Assiniboine and Douglas—which suggested many pleasurable and exciting memories. How serene Nature presented itself here and how uplifting its aspect above the terrible turmoil and chaos elsewhere on the globe!

Mount Moloch

The following morning, the weather being still very warm and fine, Feuz and I went to Glacier; and the next day saw us in Revelstoke to buy a week's provisions and make arrangements with a packer for a trip up the north fork of the Illecillewaet, the start for which was to be made from Albert Canyon. We were assured that the trail and its bridges were in fair order, and that horses could be safely taken, if procurable. We managed to procure two ancient beasts. After lunching in the last mentioned place at the domicile of a certain Carlsen, whose household seems to have a thorough understanding of these matters and appeared keenly interested in our trip, the party, consisting of Feuz, his brother, packer Peterson, with two horses and myself, started on the afternoon of August 18th and proceeded the same day about 7½ miles up the trail. It was on the whole surprisingly good, the bridges having recently been repaired. The weather was showery, and the wood and brush very wet, and a good camping ground was hard to find, the Selkirks in this respect notoriously

falling far behind the Rockies. We had to pitch our tent partly in the trail and the night was passed not very comfortably.

For a great part of the way up the Valley, the road runs through lines of magnificent cedars and hemlock, which would excite the admiration of the dullest observer. Two miles from our first camping place, we crossed Klondike Bridge, close to which is fair camping ground, of which we availed ourselves on the return journey, and after which the Valley, hitherto very confined and not very interesting, opens out and affords views of some of the distant peaks and snowfields. We pushed on to what is strangely called "the Farm" (about 3,300 feet), which to one of the party at least proved a great disappointment. It is an unattractive spot frequented by porcupines. Here we rested, and indeed had to rest for some two hours, in the interests of a thirty-year old horse which appeared unlikely to make the remainder of the journey if we didn't. On the way we had obtained an excellent view of the very striking Fang Rock, still unclimbed, on the west side of the North Branch. It was our intention to try it on our return, but we were now anxious to reach as quickly as possible our objective, Mount Moloch, the aim of several previous mountaineering attempts, and now again as we had heard at Albert Canyon the goal of a rival party.

After some five miles from the Farm, one reaches the second of the two large tributary creeks which flow into the main torrent from the west, and "up its narrow valley a grand glacial amphitheatre surrounded by precipitous walls and occupied by wide confluent ice streams could be seen through the trees."* At the head of this valley

*Howard Palmer, Exploration in the Selkirks, chap. XX. Mr. Palmer's careful description of the valley of the North Fork, and Mr. Sissons' sympathetic article in the A.C.C. Journal, vol. V., pp. 34-43, relieve me of entering into details.

on the left lies Mount Moloch. We camped in view of both valley and peak on the trail, which at this point runs several hundred feet above the North Fork. We were now about twenty miles from Albert Canyon, and at an altitude of approximately 5,000 feet.

We intended, of course, not to lose any time in trying a contest with the peak, and had determined making a side camp as near to its base as possible; but uncertain weather next morning, August 20th, deterred us making an early start. While at breakfast about 7 o'clock, Edward Feuz, who had been eagerly scanning the mountain with his glasses, caused some excitement by informing us that he saw a party of three men crossing the upper moraine at the head of the lateral valley, and making for the lower snow on the northeast side of the peak. The party, who provided us with this experience rare in the Rockies, turned out to be Mr. C. B. Sissons, an earlier visitor to and admirer of the valley, and two friends from Toronto, of whose intentions we had heard rumours. We watched their progress intently for the next hour, during which they appeared to advance at a good rate. After losing sight of them for a while, we again saw them very clearly about 10 o'clock on the upper glacier approaching the higher rocks on the north side of the mountain. Again we lost sight of them until towards 1 p.m., when we saw one of the party on the top of a lower snow peak, of which it was impossible for us to tell whether or not it formed an arête continuous with the main massif of Moloch. If it did, the peak was assuredly theirs. As we learned afterwards, it did not afford an accessible approach to the summit, but in the meantime I lost a bet with one of the guides over it.

Having watched our rivals with varying feelings as long as we could, we set about completing our own preparations for making a fly camp up the side of the valley. Carrying two days food, a blanket each, and a

small tent, the guides and myself left the packer to look after the horses and the remainder of the camp material. After a quick descent towards the main stream and crossing it by means of a little manœuvring, we had to struggle with alders, which were succeeded by heavier timber, and then alders again. Nearly three hours were spent in reaching a camping ground at the side of the black and dirty torrent which pours down from Moloch Glacier. Mr. Sissons' capacious tent was nearby, admirably pitched on a small tongue of land commanding a fine view of the little valley and the precipitous northeastern wall of Mount Moloch. Our expectations of seeing him and his friends the same evening were not fulfilled.

The glacial torrent was high and very strong, and it was obvious that even in the morning it would not be easy to cross, as would have to be done since we had decided to attack the peak on the southeast side. Consequently after the tent was brushed, we looked round for a conjunction of suitable crossing place and suitable tree, and were lucky to find the latter right on the edge of the bank, and at such a place that when it was felled it lay across the stream conveniently high above the water and held fast by the further bank. The night was very cool and the air very damp, and being without my sleeping bag, and having far too few blankets, I scarcely slept, and felt fatigued when we started out next day.

August 21st opened favourably, and we set out at 4.30 o'clock, crossed the stream by our tree bridge, and after a few minutes in the alders reached shale and rock, over which we ascended to steep grassy ledges covered at places with nasty and impeding scrub and bushes. These afforded unpleasant work for about an hour, after which we came out on a grassy knoll and thence ascended over heavy boulders and terminal moraine to a glacier, fairly

dry but considerably crevassed. On the glacier we roped, and working our way without any difficulty across the ice, reached a snowfield on which we were able to advance more rapidly. Unfortunately, owing to wide crevasses, we could not make straight for the base of our peak, but were obliged to describe a wide semi-circle to the left, which cost us about an hour's time. Thereafter we swung to the right, and by carefully turning several large holes and crevasses, gained some lower outcropping rocks beneath the southeast face of the mountain. Here we rested at 8 o'clock, and partook of the usual second breakfast.

Further snow intervened between this point and the base of the main massif, which we approached on the southeast. The peak from this side bears a certain resemblance to Sir Donald seen from Glacier. Its sides, however, are steeper, more ledgeless, and offer but few decent hand-holds. Our ascent was much slower than we anticipated, I being hampered through lack of rope-soled shoes, heedlessly left behind, which lend a certain lightness to your body, and enable you to step confidently on almost imperceptible ledges on perpendicular cliffs, so that it required almost two hours of fatiguing and really difficult work to reach the main arête. This is very sharp and steep, with much rotten rock, but the going on it was fairly easy for a time, until a steep buttress was reached which forced us to traverse leftwards. The traverse brought us to a couloir by the side of which we ascended for several hundred feet; then a sharp traverse to the right led again to the arête, which, steep and narrow as it was, we followed to the first summit at 12.30 o'clock. Just immediately below this, there is a smooth and difficult nose of about fifteen feet to overcome.

Mount Moloch is really a twin peak, and there being no stoneman on either of the peaks, we drew the correct

inference regarding Mr. Sissons' attempt. Although partly prepared for it, we were still a little disappointed to find that the higher peak of the two (about 100 to 150 feet higher than the point we were on), lay at a distance of about a quarter of a mile, and was approachable only by means of an exceedingly narrow and much indentated ridge, the traverse of which in both directions would probably have required at least three hours. For most of the way it would have been a case of only one man moving at a time. The amateur felt very tired, and, not relishing the prospect of remaining out over night on upper rocks or on snow, decided against its being undertaken. We were satisfied in having solved the problem of the route of ascent, and in having reached 10,000 feet; and after an hour's laziness in summit sunshine began the descent, a process which required considerable care and alertness.* Above the bergschrund, the negotiating of which demanded experience as well as caution, steps had to be cut in dirty, flinty ice for almost an hour. Having varied our route it was not so simple a matter as it looked to reach the lower snowfield, and we were not well down on it until 6.30 p.m. It presented a most extraordinary appearance, which had increased as the day wore on, and was now seamed by intensely bright lines of colouring matter which had come down from certain adjacent chocolate-looking cliffs and ribbed it with streams of what looked like tomato sauce. Re-crossing the snowfield and glacier by the route of the morning, we reached the grassy knoll in waning daylight at 7.45 o'clock. A lantern had to be used in getting down through shrub and alder, a particularly unpleasant bit of work in the dark. At 9 p.m. we reached the stream, where we found Mr. Sissons and his companions, greatly

*The views from the summit ridge were neither especially fine nor remarkable, except for two beautiful glaciers in the southwest, which sweep down in most symmetrical fashion towards Mt. Moloch and unite.

Photo, E. Feuz

SUMMIT RIDGE OF MT. MOLOCH

interested in our activities, waiting to receive us with most welcome refreshments. They had found the mountain practically unscalable from the side of their approach.

On our return journey we stopped below "the Farm" to consider what chance there was of having a try at Fang Rock. Exploration of the banks of the North Fork, which was very swollen and almost as black as if it were a coal-dust chute, showed that it would be impossible to ford it, either on foot or by means of the horses: and since there was no chance of making a tree bridge, we were obliged to give up the plan.

Mount Goodsir

After several delightful days spent at Glacier, where Feuz and I climbed Sir Donald by the northwest arête, which was in capital condition, for rope-soled shoes, and which affords the best bit of pure rock climbing I am acquainted with in our mountains, when both quality and length of climb are taken account of, we met again at Field on August 30th, and on the following day went by train to Leanchoil where we joined our pack train for the Ice River Valley. The afternoon of September 1st saw us encamped immediately below our goal, the south tower of Mount Goodsir, of which we proposed to make a complete traverse, it being almost the only important peak within sight of the C.P. Railway which we had not climbed. Much to my annoyance, the packer insisted on camping too low down in the main valley of the Ice River instead of up in Zinc Gulch, which ends at the base of the southwest ridge of the south tower. There was thus entailed on us some 3,000 feet of extra labour on the climb.

Clouds rested on the top of the south tower all afternoon of the 1st, and on the following morning Feuz wakened me with the disappointing news that the

weather was unsuitable for climbing. After a little rain it brightened up, and we set off on the interesting work of reconnoitering the peak. Far up in Zinc Gulch we found the remains of several camps, and an excellent trail running up by the stream on the right hand side. It was not a difficult matter to make out in general the route we should have to take, only the last few hundred feet appearing at all uncertain. We returned to camp early in the afternoon, and had some excellent fun catching the white trout which could be easily counted and watched taking the hook, in the clear water running into the main stream.

Next morning the omens in the shape of weather being propitious, we started at 2.30 o'clock, and crossing the stream issuing from Zinc Gulch made up through the wood on the right of our camp, and reached the aforementioned trail. Following it to the end, we struck to the left and ascended over grass and through light bush to an outjutting shoulder of the southwest ridge of the south tower. The ascent was very simple for a considerable distance, and we were much interested and amused by the antics of numerous goats which allowed us to approach comparatively near. These early hours of fresh energy, of freedom from care and of eager expectation are the best and richest of the climbing day.

At about 9,000 feet the rocks became steeper, and Feuz, who never takes any unnecessary chances, brought out the rope. The only possible source of danger lay in the disintegrated character of the rock which crumbled and fell away under one's attempts to find any hand-holds. At about 10,000 feet we traversed to the left, and went up a little couloir containing ice and snow. This brought us out to the main arête on which we found little difficulty until a reddish colored and almost horizontal line of rock was reached, in regard to which we had speculated a good bit when below. It was several

hundred yards in length, extremely fragile, and, to our surprise, so extremely knife-like in places, that we had sometimes to sit down and cross it straddle-wise. Here only one of us could move at a time, and that too very gingerly. It felt at times as if the whole bridge might give way. Once across it we came to the wall of red-banded rocks which form the summit crest, and skirting these to the right found a practicable route of ascent to the finely shaped summit, which was covered with snow, but did not present any of the striking features formerly noticed by Professor Fay. It was a clear still day, and actually warm on the summit, where three-quarters of an hour passed all too rapidly.

Thus far I think there is little doubt that our route was practically the same as that taken by Fay's and Outram's parties. From here we intended to vary the climb; the new part of the mountain lay before us.

Leaving the summit shortly before noon, we descended by the steep, north side of the arête, on which no difficulty was encountered for the first 400 to 500 feet. Then several prominent pinnacles were met with which barred the way. We tried to climb over the first of these, but were forced to desist on account of the impossibility of finding any decent footholds or secure hand-holds on their perpendicular and crumbling faces. By descending, however, some distance on the left, it was possible to make a traverse and circumvent these obstacles, and thereafter regain the arête, on which we made a fairly rapid descent for 1,000 feet more. The rocks were sharp and treacherous, but not difficult.

When we had traversed the greater part of the main arête, we were tempted to alter our original plan by leaving it for a broad couloir which appeared to hold out the prospect of leading directly down to some upper snow on the west side of the mountain whence

further descent would be a relatively simple affair. After descending some 1,200 feet, doubts presented themselves, however, as to whether it would be possible to reach the snow, and whether there would be any means of escape from a not improbable *impasse*. Such a possibility seemingly presented itself on the right in the shape of a slender ledge under some black cliffs over which poured a regular waterfall of melting ice. We thought it might lead us out of our difficulty, but as it looked risky we in the meantime let it alone and descended several hundred feet further. We looked around in all directions for a solution of the situation, and thought that a way of escape might be provided through a rather difficult traverse to the right and a subsequent roping off from a protruding rock pinnacle. We began the traverse but quickly realized that the eroded character of the rock, the length of the drop, and the possession of only one rope, would render the whole operation an extremely precarious one; and it was even doubtful whether with the utmost exertion we could reach the roping off place at all. We decided, therefore, that there was nothing to do but to retrace our steps upwards for several hundred feet and make another examination of the already mentioned ledge. During all the time down and up these cliffs we had constantly to look out for falling stones, which frequently hurtled past us in unpleasant proximity.

Besides being most unpleasantly wet, the position near the ledge was very awkward. To actually reach and stand upon the ledge involved a both difficult and dangerous outside traverse, below which the rocks fell away very abruptly, and above which the hand-holds were extremely slight and very scarce. Further on the ledge broadened out and might be all right, if attained. It was certainly a case of the first steps counting. I supported one of Feuz's feet in a very slight niche in the

rock, and after several attempts he managed to draw himself around the curved and bulging buttress, but was then stuck until, while hanging on his right hand, he managed with his left to hammer out with his ice-axe a further somewhat precarious foothold. I disliked the place very much, and having made several not very energetic and quite ineffectual attempts to follow, I decided to desist; firstly, because it was not possible for the leader to hold me on the rope if I slipped, and secondly, because we were not certain that the route would lead to safety. Next day Feuz was of opinion that it would have afforded a solution of our difficulties, but under the circumstances he did not urge me to try it. For him to retrace his footsteps was a difficult and risky operation, but by wedging the rope between a jutting bit of rock and the main cliff, and by my supporting his right foot, he was able, after a couple of preliminary essays, to swing himself around to the place where I stood in the line of the dripping water.

To face the remaining alternative of spending a fairly long night on the mountain was most unattractive, but it was unavoidable; for by this time it was 6.30 p.m., and in less than an hour it would be totally dark. The thought of re-ascending the couloir and of regaining the main arête in order to survey the ground once again had to be put aside before we were half way up, owing to failing daylight, and so, making a short traverse to the left, we stopped a little after 7 p.m. on a fairly broad ledge or terrace covered with gravel and stone at an altitude of some 9,500 feet. Here we at once set about scooping away some of the loose stuff with our ice axes, so as to render the ground a little less unsuitable for the extension of our bodies. By 7.30 it was quite dark. And having taken off our boots, put on our canvas shoes, puttees and gloves, and partaken of a little unpalatable food, we tried to induce sleep by stretching

ELUSIVE MOUNT MOLOCH

By Paul A. W. Wallace

Few virgin peaks of Canada boast a history of six assaults repulsed. One that does is entitled to respect. In the northern Selkirks, some twenty-five miles by trail and bush from Albert Canyon, stands a mountain the prestige of whose gaunt and massive walls has grown fat upon the defeats of its assailants. Wherefore, to the initiated, romance is wound about the name of Mt. Moloch.

Aesthetically, Mt. Moloch belongs to the masterpieces of nature. Its altitude of 10,198 feet permits it to dominate the immediate neighborhood, while its extraordinary ring of precipices compares favorably with those of loftier peaks in the qualities of the gracefully gigantic. No less attractive to that combative type of mountaineer whose footprints leave such pleasant marks upon the printed page, is Mt. Moloch's comparative inaccessibility, for it excels in a quality withering to the cragsman's art but charming to his pugnacity: the quality of unmitigated nastiness of rock. From base to pinnacle there is not a thing adhesive. The surface rocks, like boarders, are perpetually on the point of moving away. The climber's art consists in letting them go. If a trained cat could be sent ahead with ropes . . (Censored).

In August, 1915, Prof. C. B. Sissons organized a fifth attempt to put the apex of this graven image into print. The initial stages of the journey were inauspicious. Prof. Sissons, H. Bennett, companion of two earlier expeditions, and the writer as official eyewitness, donned after-midnight packs at a C.P.R. switch called Flat Creek, accursed, and devoted themselves to a sweltering pass with a phantom trail somewhere above

the headwaters of Caribou Creek. An old mining trail, the Waverley Road, approaches Moloch Valley from Albert Canyon along the North Fork of the Illecillewaet, but our information warned us against trying the regular route, for the Klondike Bridge had been destroyed by an avalanche, and the river is everywhere unfordable. The Caribou Creek way was our unhappy alternative. Storm delayed us on the pass until evening of the third day, when we penetrated some Selkirk abatis with barb wire entanglements, stumbled on to the trail above the Klondike, and found the road completely renewed, bridges and all, even the grass being cut. We had spent three wilderness days avoiding a graded road. . . . The verdict was unanimous.

A night at the Farm and a day under packs brought us face to face with Moloch. Afternoon found our tent commanding a view of that quaintly carved cirque sweeping up to the grim old idol, lap full of ice, where the two tree spears stand out like measuring sticks against the pallor of the shadowed glacier. Though the scene as a whole is of a type unique in our collective experience, Moloch itself, a fortress cliff of naked rock, from this point of view, suggests comparison with the Wetterhorn. The types differ in this, that where the Wetterhorn finds glaring contrast, Moloch revels in harmonious setting. Seen from the Kleine Scheidegg, the Wetterhorn spurns the tame little pass at its feet, using it in one sense as a foil, but not at all as a background while Moloch, abrupt a mountain as one could wish, is nevertheless in subtlest harmony with the minaretted cirque which partially enfolds it from the rear and wholly walls in the upper reaches of the valley. Ice and rock are mingled there in exquisite proportion. With sweeping arms, the crumpled glaciers clutch at Gothic towers of peak and cliff. The blue sky, cramped by dazzling roofs of snow, is slashed with a smooth, gray spire that pierces both. Through a cleft among the

crags, a trickling glacier crowns the barren precipice with a green fringe of ice. There is majesty and magic in the hills.

Also porcupines; but more of that anon.

We were growing maudlin with scenery when a fortunate dispute arose regarding the period likely to elapse before the companies run a scenic railway to the spot. The pessimist said fifty years; but the others, more sanguine, placed it at five hundred.

That same night, we bivouacked higher up toward the Candle Extinguisher (or the Fool's Cap as it might be called, with small loss to rhetoric and none at all to antiquarians, to distinguish it from others of that ilk). A huge tree protected and at the same time betrayed us, for, while promising to ward off the rain which never came, it delivered us into the jaws of a gormandizing porcupine who left home among the roots that formed our pillow to partake with us of the delicacies of our boots and leather pack straps. I awoke just as he was about to step from our containing log to Bennett's chest. If I had held my peace, I might have seen a good fight. I was an eyewitness, not a reporter. But there, man is human first and intelligent afterwards. Involuntarily I blurted out a "*noli prosequi*," whereupon the procupine offered me his tail to shake and, gentlemanlike, withdrew. They are very modest animals, porcupines. A word to them is better than a blow. But the rescued Bennett turned himself over with his elbow, and made a few laborious suggestions about moderating my conversation in my sleep.

The apex of Moloch is the focus of four ridges. On the south lies a hanging ridge whose jagged contour and isolation from approach render it impracticable. On the east, two ridges unite to form a "Y," the trunk of which leads from the great shoulder of Moloch to the peak. From below, this shoulder seems worthy to be called a

Photo, P. A. W. Wallace
GLACIER VALLEY BELOW MT. MOLOCH

Photo, P. A. W. Wallace
THE TEMPLE OF BAAL

second peak, but photographs taken at its own height from Mt. Sorcerer to the north, show it to be merely the undistinguished end of a long, level ridge which culminates at the other extremity in a perpendicular tower. Prof. Sissons in 1912 had twice assaulted the shoulder unsuccessfully by way of the northeast ridge. Across the stupendous gulf of the "Y," the southeast ridge presented too many points of similarity with its mate to inspire confidence. Remaining attempts by Prof. Sissons were accordingly made upon the west side, where one attack in 1913 petered out in opaque meteorological phenomena, and another of the same year terminated at the jaws of an avalanche-devouring bergschrund. But a reformed bergschrund is always a possibility, and even Selkirk weather must have an occasional Sabbath.

The west ridge, descending steeply from Moloch, sinks into a col between Moloch and a flanking peak which we named Mt. Baal. To storm the face of the col is impracticable. Accordingly, we planned to reach it via Mt. Baal.

Baal is a twin summit down whose broad bosom flows a very steep but singularly regular glacier, broken clean across the middle by a straight and gaping bergschrund. We reached the bergschrund at nine o'clock on the morning of August 20th. Our route, which had entailed the half circuit by glacier of the Fool's Cap, presented no difficulties unfamiliar to any who have ascended Mount Royal in winter by the Côte de Neige. Its scenic attractions are absolutely startling. We retain vividly in mind the apparition of a gigantic obelisk spuming in the torrent of the clouds. That was Moloch, a mile or two away across the angle of the valley. No less spectacular were the interiors of the Temples of Baal, more than palatial caverns hollowed from the glacier, relics of an ancient bergschrund, into which we delved by balustrades of snow. Here the blue of heaven,

rescued from the flat, perspectiveless cupola of the sky, lay radiant and carven, embodied in the pure, deep ice of decades. The next traveller will find these halls much changed, for they move upon a ceaseless voyage towards dissolution where mud and scree conceal the transformation of royal ice to a smutty vagabond of a stream brawling seaward through the scrub.

The schrund was bound by unattractive, ice-varnished rocks on either flank. It slashed through a remarkably steep snow-slope, and therefore the one lip greatly overtopped the other. There were no snow bridges, the walls seemed everywhere sheer, and only in three places did they approach each other. We selected the narrowest point and went to work. Even here, owing to the manner in which one lip overtopped the other, progress would have been obviously blocked had it not been for the happy juxtaposition of a tapering crest of snow, raised wall-like, from the lower side, and a corresponding trough gouged neatly from the upper. Our problem was to use the wall without destroying it. To clamber straight over and jump would crumble it to pieces. Moreover, even if the snow did justify its use as a *point d'appui*, there was no certainty of adhering to the far side after the jump.

The omens indicated an unpleasant traverse of precipitous avalanche grooves in search of a better crossing. But the omens lied. Prof. Sissons made his way into the schrund and slid along to the end of a ledge that brought him almost beneath the ridge and funnel. He cut a step in the vertical ice across the way, straddled the gap, and then continued to cut steps back and forth, mounting straddlewise toward the desired point. A few feet below the crest of the precarious wall, a firm projection brought the step cut from its surface within five feet of a final step gouged in the lip of the funnel. Here Colossus made his final stand, then flung his weight

across, gripped the snow with axe and elbows, wriggled to his knees, and squirmed to *terra firma*.

The only difficulty for those roped behind was to adjust their scarcely adequate limbs to the exigencies of a five-foot span. It is said that the Dolomite guides can stretch themselves. Goodness knows we don't doubt it.

For some hundreds of feet the snow kept a very steep angle. Under certain weather conditions, this climb might prove extremely unpleasant, or even precarious, as, indeed, one party had already found it; but we made it under ideal conditions, finding the snow of such excellent texture that there was neither a tendency toward avalanches nor any necessity of cutting steps. At twelve o'clock, Mt. Baal for the first time felt the foot of an invader.

Baal is part of the Moloch massif, but deserves home rule in the matter of nomenclature. It is separated from the mother peak by a deep col a good (or, rather, excruciatingly bad) four hundred feet deep and a quarter of a mile long. This col, by the way, belongs to Baal rather than Moloch, as we soon discovered. The glacier gives Baal a pleasing character of its own and in marked contrast with the austerity of Moloch. In shape, color, and the matter of raiment, the two mountains are utterly unlike.

Thanks to its middle stature and proximity to a spectacular neighbor, Baal is not easily to be excelled as a point of view. Now, the duties of an official eyewitness, being, as everyone knows, to acquire the maximum of local color with the minimum of inconvenience, necessitated the division of our party on the basis of athlete and aesthete, the former girding up their ropes while the latter picked out some soft rocks with which to facilitate his investigation of the panorama.

To the right of Moloch's desert cliffs, that is to say, to the south and east, lies a field for discovery in a

wilderness of ice drained by twin glaciers, with a beautiful system of crevasses and moraines. Nearby stands Fang Rock, and, to the left, like more teeth against the sky (molars, in this case) lie Sir Sandford, Iconoclast and Sorcerer. Westward, towards the Columbia River . . . But if I attempted to describe a tithe of what I saw in the white seas fading blue on the shattered horizon, I should merely inspire the bored reader with regret that I had ever been allowed to look upon this thing at all.

We were still a good two hundred feet lower than the summit of Moloch. The advance involved a descent of some four hundred feet over disintegrated rock lying at a hazardous pitch. Then followed a long, level ridge, with a sharp spine and a few notches at the critical junction with the peak, which raised half a thousand feet of presumably heathenish rock with an average inclination of about forty-five degrees. But although there were some very abrupt passages among the lower reaches, there was nothing visible from a distance to annihilate hope.

The athletes made their way clattering, pawing, crawling, over the first few yards of descent. It took them half an hour to get back up again, but they had to come. Baal is not neatly jointed with the col. Selecting a new route, one modelled on a damaged coal-shoot, they allowed themselves to be lowered on the rope over a preliminary bit of nastiness that merely introduced the unpleasantness to follow. Slithering scree coated everything. Odd finger-holds and inch ledges were as jewels to the touch. Once Mr. Bennett found himself hanging by three fingers of one hand. Through lack of anchorages, relaying was impossible, and rare were the opportunities of recovering a slip. Climbing under such circumstances is as much a matter of nerve as of agility and cannot be hurried. Two o'clock was striking in the

Photo, P. A. W. Wallace

MT. MOLOCH

Photo, P. A. W. Wallace

MT. MOLOCH FROM BAAL

towns beyond the ranges when the climbers reached the far end of the col.

The nature of the place was soon apparent. The notches seen and feared from Baal, proved to be divisions between four or five camels, or gendarmes, too sheer and rotten for a practicable traverse. Investigation of these cleverly contrived outworks of defence, forced from the party the reluctant admission:

"It may be possible, but it is not mountaineering."

These camels are the keys to Moloch. If they could be passed, as they probably could be under favorable conditions of time, there is at least an even chance that nothing baffling would be encountered on the slope beyond, although the ridge itself, owing to occasional perpendicularities, would have to be forsaken for the less inhospitable face of the cliff. The route would be to angle across to the right into the couloir beneath the little patch of snow.

Roughly speaking, there are now two routes of ascent in sight: via Baal on the west, and via the shoulder on the east. Prof. J. W. A. Hickson, with Edouard and Ernst Feuz, reached the shoulder on the day following our ascent of Baal, thus bringing the total of attempts to six. They attained an altitude about equal to that of Baal, and brought back no very sanguine report of the prospects between the shoulder and the peak. A comparison of the two routes makes it evident that while the camels on the Baal side present a serious obstacle, in the other quarter the interminable reaches of untrustworthy rock, added to the uncertainty beyond the shoulder of avoiding precisely the difficulty that baffled progress on the west (bad plumbing at the joint), render climbing both precarious and disappointing. "There is nothing worse in Canada," remarked Ernst Feuz at the end of his sixteen hours climb. For scenery, Baal is *the* ascent of the neighborhood. As a way to Moloch, it will

at least allow the climber to come to grips with the final peak unexhausted. To scale the mountain from either direction, it would appear advisable to spend a night on the rocks. This could easily be accomplished on the Baal side, either at the col, or lower down at the Fool's Cap.

Sissons and Bennett made their way back in about two hours to Baal, where a cairn had been erected during their absence. Having plenty of time to spare, the eyewitness perversely neglected to place any records in the cairn, but the field glasses of Prof. Hickson, who watched our operations from the valley, will corroborate the details here set forth.

At 4 p.m. we struck for home. Some careful relay work brought us over the sun-loosened snow to the bergschrund, which we cleared with a leap, and by dark we reached our bivouac among the balsams.

Next day, we went scouting for a feasible route, a sort of forlorn hope, by the southeast fork of the "Y" on the east; but the report which Prof. Hickson brought that night from the shoulder was not of a nature to encourage new enterprises from that quarter.

Accordingly, on the following day, we shouldered our packs and struck for the Waverley Road, which we followed northward to the pass. On August 23rd, Sissons and Bennett put in a long and interesting climb upon Mt. Sorcerer (10,410), the account of which is here given in Prof. Sissons words:

"We traversed the whole length of the southeast ridge. First occupying a peak (about 9,000 feet high) on the southeast of the ridge at 9.30, we journeyed till 4 p.m. up and down along an arête whose excellent rock (sometimes very steep and in one place super-perpendicular) contrasted favorably with that of Moloch. Only near the top did we take to the snow, where we had to cut a few steps. At about 1.30, we passed a cairn, doubtless erected by Messrs. Palmer, Holway and

Butters on the little peak mentioned on page 289 of Mr. Palmer's book. There were records (damaged by the water) in a bottle. We descended by their route of ascent."

Meanwhile, the eyewitness, after eyewitnessing some of the numerous waterfalls for which the Waverley Road will one day be famous, returned to camp and concocted from the commissariat remains some gravitative bannocks with which to lay to their rest the peak-hunters "home from the hill."

The twenty-six miles (avoirdupois) to town, we accomplished on porridge and cocoa. On the train, an American naval officer gave us a synopsis of ten days' war censorship, and elderly female tourists returning from the Panama Exhibition buttonholed us, as eagerly as entomologists do butterflies, to ask: "Are you the people that climb mountains?"

As the Million Guide has pathetically put it:

"Ze whole trip and ze whole choy vas over!"

ASCENT OF MT. BLACK DOUGLAS

By C. A. Richardson

After a delightful two days' stay at the camp on the Red Deer, we (J. C. Oxborough, Christian Jorimann and the writer) prepared for our attack on Black Douglas. Our plan was to skirt the north slope of Oyster Mountain and bivouac as near the Douglas as possible.

Leaving camp at 4 p.m. with our packs, we circled the lake and entered the woods on the east. Our way was fairly easy at first, but increased in difficulty as we continued. Windfalls and large boulders were numerous. We decided at last that we were keeping too far up the slope so worked our way down and at last came to good going in a grassy plain. We were fortunate in finding the trail blazed by the party who had made the climb a few days previously. By following this trail we at length came to a higher alp almost parklike in appearance.

A passing thunderstorm had been drenching us for the past hour and we were wet to the skin. The storm was clearing as we entered the open valley and we took time to light a fire and dry our clothes. We then continued to the head of the valley and found a delightful camping place a few rods from the glacier leading to White Douglas.

Supper and the preparation for the night occupied our attention until 9.30. We made our beds under a large spruce and were quite cozy. It was the intention to rise at 3 a.m. and start at 4, but owing to our fatigue and the comfortable beds we slept until 4.

From the site of our bivouac, we had but a few steps to cross before we came to the slopes of the mountain. We could easily trace complete strata from our camp

site at a grade of perhaps sixty degrees to the snow-capped peak.

To the west of the Douglas peaks there is a beautiful amphitheatre with the White Douglas glacier on the south. This glacier seemed of easy gradient and made a splendid approach to the cliffs of White Douglas. We had splendid views of the latter peak from our bivouac and as we climbed the north peak we could see more clearly the difficulties to be overcome in a climb of the southern peak. Sheer cliffs rose to a great height, in many parts overhanging and with scarce a crack or crevice visible. We concluded that two hours from our camp would easily bring us to the base of the cliffs and decided that it would be an ideal spot from which to make an attack on the White Tower.

Leaving the bivouac at 5 a.m. we crossed to the foot of a cliff that rose from a height of a few feet at the base of the mountain to many hundreds towards the top. The going was very good close in to the base, and the slope not too steep. It was a grind, however, and after about two hours of it we were not sorry when Christian said we would try a rocky gully that opened up directly from the scree. It was from four feet to six feet wide and seemed to come out on a wide ledge some hundreds of feet above.

The morning was cloudless and quite warm and we had made no preparations against the cold. When we entered the gully we found the temperature considerably lower than was pleasant and although the air was quite calm in the valley there was a strong cold draught blowing down the gully. The first part was fairly easy, perhaps one-third the way, then we came to solid black ice filling the gully from side to side and quite smooth.

Christian began step-cutting and Oxborough and myself had the pleasant experience, for the next hour, of being showered with ice-particles. To make matters

more unpleasant, we were continually passing under little streams of water from the overhanging walls above. It was not an easy matter to dodge these, as the ice steps were none too large and one had to be careful of one's balance. However, everything must have an end, and so with the gully. The ice gradually finished off to a sharp point with just space enough on one side for a person to squeeze between the ice and the rock wall.

Here we had our first real thrill. Christian climbed on the point of ice to negotiate a rock wall just above. As he put his weight on the point a large piece broke off and started slowly down the slope. It blocked the gully from side to side and the writer was directly in its path about ten feet below, still standing in the ice-step. Christian shouted to me to come up quickly, but, alas! I was in the last step next to Oxborough and could not move. Oxborough by this time had wedged himself between the ice and the wall and as the large piece of ice moved down it caught him across the chest and jammed him to the rocks. He served as the necessary trig, however, and its progress stopped. I did not envy Oxborough in his position, but he seemed much concerned about me. After a few seconds he was able to move his foot from the last step and I moved up to it. This brought the loose ice about my shoulder. I crouched and wedged in as well as I could to the cliff and then called to Christian to start the ice moving. This he did and the ice sliding swiftly, one edge brushing my shoulder, went crashing down over the spot where I had been standing a few seconds previously.

We had now come to a rock wall about twenty feet high with a narrow ledge at top. Christian started on the climb and found after getting part way up that he had no grip in his hands, as they were by now numb with cold, and there he was, spreadeagled on the rock-face. He could move neither up nor down. If he dropped he struck the ice and followed the broken fragment. The writer

Photo, F. O' N. Fisher

THE BLACK DOUGLAS
From Hatchet Lake

Photo, F. O' N. Fisher

T E WHITE DOUGLAS
From the Black Douglas

scrambled over to Oxborough and tried the cliff from the outer end. On touching the rock I found that the first joint in my fingers had no feeling whatever and I hardly liked to attempt the climb. Something had to be done quickly, however, as Christian was calling that he could not hold on much longer, so I made the attempt. The climb was fairly difficult with one's hands in good condition, but as mine were, it seemed hopeless. Christian's condition by this time was serious and I must have been assisted by the excitement of the moment, as I soon found myself on the narrow ledge above. How I did it I do not know. I moved directly over Christian and stretched full length on the ledge, reaching my left arm down to him, while my right was anchored securely about a pinnacle of rock at the back of the ledge. By grasping one another's wrists a fairly safe grip was secured and Christian was enabled to get his other hand over the square edge of the shelf. I then pulled with all my strength and his other hand was clasped over the edge. He was then able to reach the pinnacle of rock and slowly drew himself on to the ledge. Two such thrills as we had experienced in the last few minutes were quite enough for one climb.

I took the rope from Christian's rucksack and passed the end down to Oxborough after drawing up our own sacks and axes. I enjoyed the sight of Oxborough with benumbed fingers essaying the climb. I took care to have the rope well anchored and with this support he soon made the ledge. We then moved along the ledge through a natural doorway onto a broad flat surface about thirty yards square. It was now nearly nine o'clock. The sun was quite bright and the flat well sheltered from any breeze. We stretched out and for half an hour soaked in the sunshine and heat and enjoyed a second breakfast.

From this flat the going was easy and we soon reached the snow-slope on the northwest side. Here we found

the steps of Ernest's party still in good condition so we made good time to the summit, which, to our great disappointment, was shrouded in mist. We remained on top for over an hour and were rewarded at last by having a magnificent view to the south. Close at hand, seemingly only a stone's throw away, was the square tower of White Douglas. We examined it as well as we could, and Christian said he would like very much to attempt it if we could remain another day, but as the main camp was breaking up, we could no do so.

The descent was easy except in one or two places, where we had to cross wet slabs of rock. The strata all sloped outwards at an angle of about thirty degrees and as the snow was melting rapidly they were wet and slippery.

We arrived at the "Bivouac" at two p.m. After a lunch with a plentiful supply of tea we shouldered our packs and returned to the camp at the lake, arriving at four p.m. Another lunch, and then we accompanied the remainder of the party back to the main camp. A soaking rain added pleasure to the latter part of the trip. A good dinner awaited us, and then bed and a good sound sleep.

FIRST ASCENT OF MT. EDITH CAVELL AND EXPLORATIONS IN THE MT. LONGSTAFF REGION

By E. W. D. Holway

In the summer of 1915, Dr. A. J. Gilmour and the writer first spent sixteen days at the Mt. Robson camp. going to Moose Pass and returning over the glaciers, climbing Mt. Mumm and other minor peaks and getting into shape for more strenuous work. We then returned to Jasper, hired a man to help us pack and on July 31st started for Mt. Cavell, then known locally as Mt. Geikie. We had a horse take our outfit to the end of the trail above Boulder Creek (Geikie Creek), about half way, and then back-packed. We camped the first night on the creek, directly below the end of the trail, having a great tangle of burnt timber to get through. Early morning found us on our way up the creek, which we followed for some distance, and then took an upward route straight towards the low place visible to the west of our peak. Our packs were heavy and we were ready to camp early in the afternoon, but there was no water on the mountain side, and we were compelled to go on until just dark when we came to a splendid spring at the west end of the beautiful, broad, grassy pass on the south, leading over to the Whirlpool River. In the morning we set out to find a route up our mountain. We climbed the peak joining it on the west and found a narrow ridge connecting, over which we passed. We climbed to within 600 feet of the summit that day but heavy clouds surrounded us and there was a rain approaching, so we descended by the cliffs and scree slopes on the south. On the third we explored the pass, with its streams and pretty little lakes, and on

the fourth moved camp half an hour nearer the base of Mt. Cavell. On the morning of the fifth we were off at 4 a.m., reached the cliffs at 5.10 and the west arête at 6.15. Here we had to wait forty-five minutes for the clouds to blow away. There was a wide snow slope leading to the south arête but we found this was rather thin snow on hard ice and with only two, a slip would have sent us over the cliffs; so we decided upon the narrow west arête, which had a heavy cornice of snow projecting over the great north cliffs. The conditions were perfect. The snow was frozen hard to the depth of an inch, so that it was nearly continuous step cutting, very steep in the upper part. Only for a short distance did we find any ice, but to avoid it we had to keep well out on the cornice. The Doctor being in the rear and having plenty of time to look down the north face made suggestions occasionally about getting further away from the edge. There were no difficulties. Steady cutting brought us out on the top ridge at 10.03. From here it was a great snow pile, up and down, for the entire length of the top. At 10.15 we were at the middle point, which appeared to be the highest, and at 10.30 at the east end. The Doctor had carried a jointed flag pole strapped on to his back and we planted it on the middle peak with small black and white flags. The view up the Whirlpool River with its great glacier was particularly fine. At the source of the east fork of Boulder Creek were two pretty lakes and the main creek came from glaciers and a hanging valley with lakes and fine rocky peaks. As we had to back down our stairway, one at a time, we left at 11.30 and reached camp at 4.10 p.m. After a day's rest, we climbed to the summit of the peak west of Cavell, visited the lakes at the source of both forks of the creek, went up the valley on the east of Cavell and on the 11th returned to Jasper.

Outfitting again we took the train to Croydon, and on the 19th started up Horse Creek. We took the

Photo, E. W. D. Holway

THE SUMMIT OF MT. EDITH CAVELL
(Formerly Mt. Fitzhugh)

Photo, A. J. Gilmour

MT. LONGSTAFF
From the North Arête

southeast fork and went up a hanging valley at the end of the main valley, on the northeast. This had an easy looking pass so that we left lakes and lovely camping spots, expecting to find a resting place on the other side, but when we arrived at the top we looked down almost perpendicular cliffs and had to return to the lakes. Exploring for a few days we found that the only way out was over a glacier on the east of the valley and down cliffs on the other side. Our man was not used to glaciers nor taking a pack down such places, but he was game, and we let him safely down with our 100-foot alpine rope. The upper ends of all these valleys are very lovely indeed, with fine meadows, timber and lakes—ideal camping places. At the head of Horse Creek is a great glacier with several peaks about 10,500 feet, and between Horse Creek and Small River, on a branch of which we now were, is a very fine glacier-covered mountain around 10,500 feet.

Following down the creek we came to the main valley of Small River and camped under cliffs 3,000 feet high, over which many square miles of ice discharged and down which came many waterfalls. We explored this glacier, made the ascent of the two peaks south of Mt. Longstaff and on September 3rd found a way up the cliffs to the northwest arête of that mountain. We saw that we could descend some distance over the east glacier and reach the face opposite Mt. Whitehorn, from where the ascent could be made. The way was long and we had seen the upper part was all ice. The arête we were on was steep, the rocks were rotten and bad and could not be followed for any distance, but there was a fine, very steep streak of ice leading nearly up. Unfortunately we decided to try it. It was much steeper than we expected and it was all hard, blue ice. It was very difficult to make steps and after working hard for many hours we saw that unless we spent a night on

the ice it was necessary to quit. We were, perhaps, within 200 feet of the top.

We arrived at camp at 9.30 p.m., pulled our man out of bed and had a feast. Alas! we nearly finished the grub at that meal. An investigation in the morning showed only enough for breakfast and a slim lunch. There was nothing to do but get out. We followed Small River to a cabin on the Fraser, where we found flour and potatoes, crossed in the morning to an old construction camp, where there were just spikes enough to build a small raft, upon which we piled our things and floated down to Croydon, where we had left our trunks.

There is a wonderful field for exploration, especially in the big bend of the Fraser.

SCIENTIFIC SECTION

THE BUILDING OF THE TORNGATS

By A. P. Coleman

Most people think of the mountaineer as simply an adventurer or athlete who enjoys a sport full of hardship and danger in which he matches his physical prowess against the difficulties of scaling cliffs, crossing glaciers and climbing peaks in the mountains. There is no doubt keen joy in the sporting side of mountaineering, in striving and overcoming difficulties, and above all in conquering new peaks; but to many of us the scientific interest of a mountain region presents quite as great an attraction as the manly sport of climbing itself. The two go naturally together. In many parts of the Rockies, for instance, one can hardly miss seeing that vast blocks of an ancient sea bottom have been tilted up with their edges in the sky or, in other places, that five miles thickness of sediments have been crumpled into folds, and that both have been sculptured by forces still at work into their present splendid forms.

In the comparatively youthful and simple Rocky Mountains many chapters of geological history may be read as one climbs or when one halts for a rest; but in very ancient mountain regions, such as the Laurentides of Eastern Canada or the Torngats of Labrador, the problems are much harder to solve. They may require much patient field work before certainty is reached and many of their features may remain obscure after the most careful study. In the Rockies one often sees at once how harder structures resist decay and stand up as ridges and

peaks. In the Torngats this is generally not the case, and the original strength of the rocks has very little relation to the present mountain forms.

The rocks of Labrador are mainly gneiss and schist, often sharply folded and usually steeply tilted so that one walks across their worn edges. After a time one finds that the gneisses bend round into great oval areas, usually with granite in the middle, and presently one grasps the idea that the present surface represents the ground plan or foundations of great ranges of mountains, once probably higher than the Rockies, afterwards worn down to mere stumps or even smoothed off to a plain not far above sea level. A vast length of time was required for this destruction, but the process was complete before the earliest fossil bearing rocks were formed, for in places we find marine Palaeozoic rocks resting on them.

How long the plain remained near sea level we do not know, but ultimately its margin, along the Gulf of St. Lawrence and the Atlantic Coast, was lifted up thousands of feet above the sea with an inward slope towards Hudson's Bay and Ungava Bay. Apparently as this elevation took place great faults broke across the original Archaean plain and the eastern parts slipped below the sea, leaving the present mountain regions standing up with a bold escarpment facing the north Atlantic.

The Torngat mountains began then as a tableland with a steep face eastwards and a gentle slope to the west. Where the old surface of the tableland is still preserved it is gently rolling with low rounded hills and shallow depressions between. Before the Ice Age the plateau just mentioned rose directly above the sea to heights of at least from 4,000 to 6,000 feet.

During the Ice Age, unlike all other parts of Canada except the Klondike, it appears never to have been covered with ice, though local glaciers formed in some of the

Photo, A. P. Coleman

LOOKING SEAWARD FROM NEAR SUMMIT OF MT. TETRAGONA

Photo, A. P. Coleman

CIRQUES AND U VALLEYS
Near Nakvak

hollows and especially in the river valleys, the drainage taking the solid form instead of the liquid.

The great Labrador ice sheet which overwhelmed Ontario and Quebec and pushed far south into the United States probably reached the western slope of the Torngat plateau but had not depth enough to override so lofty a barrier.

The numerous small glaciers on the seaward side carved down their beds into cirques of various depths and drained into the longer and more efficient glaciers, which sliced their way completely through the tableland in places, forming the deep troughs now occupied by the numerous and splendid fiords so characteristic of the coast. Nakvak fiord, for instance, has been shown by Professor Daly to have a depth of more than 100 fathoms in places and a length of 35 miles.

The small cirque glaciers have left very steep walled basins and short valleys, and at many points they carved their way so far back into the tableland as to come close together, leaving sharp edged ridges like Mt. Razorback, or even advanced until they met, destroying the wall between two valleys and leaving bold peaks and isolated mountains. This is especially true near the sea coast. As one goes toward the interior the carving action is less and less evident and the mountains grow broader and have dome-like surfaces, though they are in places separated by the steep walled and deep valleys cut by the main glaciers. These main lines of ice drainage may have afforded outlets to the sea for the great ice sheet of the interior of Labrador, in the same way as the interior ice of Greenland pours out between the mountains at the coast and discharges icebergs into Davis Strait.

It is evident then that the Torngats are just the remnants of a pre-glacial plateau eaten into by local glaciers in various directions. Their vertical cliffs and ragged edges, their peaks and gendarmes, are not caused

by the resistance of harder rocks when weaker beds around were destroyed by frost and weather, as in the Rockies, but are the almost accidental results of the irregular gnawing of glaciers. They are monuments to the work of ice as an agent of destruction and their peaks and cliffs have no relationship to the ancient mountain structures of the gneisses and schists out of which they have been carved.

The process of carving is not entirely finished, for there are many small glaciers still at work in the higher cirques and valleys. They do not seem to be very active, however, and frost and running water are now more important agencies. In the higher valleys frost is quarrying blocks from the walls and building up a talus, masking the handiwork of the vanished glaciers; and torrents are cutting canyons in the bottoms of the valleys destroying the beautiful U-shape which they had in the beginning. The summits of the higher dome-shaped mountains, which were not ice covered, are perfect seas of blocks of all sizes, loose and more or less weathered but evidently resting on their parent rock, gneiss on gneiss, diabase on the dikes of diabase from which they came. Here and there a small snowfield hides them but it is not in motion and does not disturb the rock fragments beneath. These fields of loose, unshaped blocks above the level of flowering plants and often devoid even of mosses are the image of desolation, and a drearier landscape cannot be imagined.

SOME METEOROLOGICAL PHENOMENA OF THE CANADIAN ROCKIES

By A. O. Wheeler

All mountain regions exhibit interesting meteorological phenomena, owing to the fact that they are subject to an abnormal amount of precipitation and are storage reservoirs for it in the form of vast bodies of snow and ice. This is particularly noticeable in regions that lie in the more northerly latitudes, where the precipitation is heavier and the varying change of seasons extends over a longer period. On such account the Canadian Rockies are of special interest.

Many of the features there presented to the observer are, in large measure, due to the warm winds created by the climatic conditions of high altitudes. In the Rockies they are known as "Chinook" winds, in the Alps of Europe as "Föhn" winds. In Canada the origin of the "Chinook" may be briefly described as follows: Winds from the Pacific Ocean travelling eastward across the continent are saturated with moisture. As they ascend the western slopes of British Columbia, the air is cooled and deposits moisture, rain at low levels, snow at higher levels. Sweeping over the high summits of the several ranges and through the passes, the air sinks rapidly and, coming under greater pressure, is heated, producing the warm dry Chinook wind noticeable in all wide valleys between the ranges and, in a much greater degree, on the western prairies of Alberta.

This process accounts for the very heavy snow-fall on the Gold and Selkirk Ranges, the first two high ranges met with in the journey from the Pacific Ocean across the central portion of the continent. It is here that the bulk of the moisture is precipitated, and what is left is

deposited on the highest or Main Range, yielding a considerably less precipitation and, consequently, a lighter snow-fall. Further north the Selkirk effects are found on the western slopes of the Main Range, where that range more nearly approaches the Pacific Coast line.

These warm winds produce many and varied changes of temperature, and are responsible for the magnificent cloud effects, seen in the spring and fall, that furnish such a wonderful setting in landscape photography of the region. They are also responsible, to a considerable extent, for the fantastic snow shapes, the result of frequent thaws followed by sharp frosts and high winds sweeping over the summits, that are seen along the mountain crests and ridges and in the valleys where snow lies well on into the summer months.

High up on the mountain slopes, far above the line of vegetation, the climber cannot but notice the beautiful sprays and branches of ice seen on the rocks, like frost designs on a window pane, and the groups of columnar icicles that hang as pendants from cornices and line cliffs and precipices. Wonderful pendants are also seen, like great ice teeth, along the lips of huge crevasses on the glaciers, extending far into their depths.

In the woods, particularly in the Selkirk Range and in the Main Range north of the Selkirks, the snow creations are of truly magnificent conception. Snow mushrooms shape themselves upon the stumps and enormous snow fungi gather on the tree trunks. The trees, themselves, become so loaded with snow that they look like white columns and give an idea of fairyland that can only be had through Nature's own handiwork. Taking into account the fact that the average annual snow-fall at Glacier House on the Canadian Pacific Railway, near the summit of the Selkirk Range, is thirty-five feet and has been known to reach to fifty feet in one winter, the results referred to are not to be wondered at.

Photo, A. O. Wheeler

A SNOW MUSHROOM

Glaciers

The subject of glaciers is one of such importance and has such a direct bearing upon nature, cause and effect in the destruction and construction of terrain that it has been classified as a science of its own, dealing directly with the action of glaciers and icebergs under the name of "glaciology." In the first place, it is dependent upon climatic conditions: temperature, precipitation, freezing and melting, but the subsequent action is so varied and far-reaching that it has been classified as above. Its many phases are too intricate to be dealt with in an article such as this and it is here only necessary to outline the general principle.

The heavy precipitation of mountainous regions falls at high levels in the form of snow, which fills the rock basins between the various summits and crests. The great weight of these enormous masses compacts the under layer into granular ice, covered on the top by the recent winter's snowfall. Thus, the beautiful stretches of pure white, illuminated by sunshine or darkened by passing cloud shadows, which we designate snowfields, are in reality bodies of ice, filling up the hollows, massing on the ledges and clinging in crystal cascades to the mountain sides.

Were the process of filling up to go on indefinitely, we should, in the course of time, find that the highest peaks would vanish under a great cap of ice which would bury them out of sight. Nature, however, in the universal balance of compensation that attends all her actions, has provided for such a contingency and, by applying the law of gravitation, has caused overflows of ice at the lowest parts of the basins. These overflows are practically rivers of ice, covered by snow until at lower levels a warm temperature melts the snow and uncovers the ice beneath. They here come under the term "glacier," or more properly speaking, "dry glacier," although they are far from dry, for the melting ice rushes in streams down the

surface and fills the hollows. At night the running water freezes and when again subjected to the warmth of the sun, the ice, through expansion, splits in many directions.

The flow of an ice river down its bed is necessarily very slow—not more than a few inches a day, depending upon the steepness of the grade. Where the bed is uneven and the flow is over ledges or precipices of rock, the ice splits in great tranverse cracks called crevasses, presenting a much broken surface, corresponding to rapids in an ordinary river. These are known as icefalls. Sometimes the cracks cross each other in opposite directions and the result is a series of pillars of fantastic shape named "*Séracs.*"

The Canadian Rockies are remarkable for the number and purity of their glaciers. Although there are none of great length, as seen in the Himalaya and other mountain ranges of the world, their wildly broken icefalls and the low altitude at which they are found—frequently below timber line—lend a picturesque charm to the scenery that is one of its most striking features. The great peaks, lined by cliff glaciers, the hanging glaciers that tumble down their sides in broken ice cascades and the far-reaching fields of snow filling the hollows are a joy to the traveller, and delight the eye in contrast with the grey limestone peaks and the hazy blue valleys of primeval forest.

Clouds

In early summer and late fall the cloud effects are magnificent. Great billows of white cumulus cloud hang over the peaks and collect along the crests of the ridges. Seen from the prairies the higher peaks of the eastern escarpment of the range are hidden in a dense bank of these white clouds. It is usually a sign of the Chinook wind and, at the break of winter, is looked for as a harbinger of spring. Prairie dwellers think of fierce winds and snow storms raging beyond this aerial barrier.

and bless their stars they are not there. Such, however, is not the case: piercing the barrier, a bright sun is found shining in the valleys, the silver streams are turning brown with rock silt and the pines are showing bright emerald green in their new spring attire, and are aromatic with the throb of life.

The study of clouds is one of deep and varied interest. You will see them suddenly appear along the face of a mountain, forming anywhere, as the warm air crosses a belt of cold shadow, the mouth of a gully or a body of ice, and as suddenly and mysteriously vanishing in the bright sunshine. Streamers of cloud will drape the summit of a high peak all day long, giving it the appearance of an active volcano. This effect is often seen on Mt. Sir Donald near Glacier House, and then the Swiss guides say: "Ha! Ole Sir Donell, he smoke him pipe."

Although these clouds look so beautiful and so inviting, travelling in them is not a pleasant process, and has the feeling of a wet blanket, sending chills creeping down one's marrow-bones. It is an eerie sensation and magnifies the close surroundings to altogether undue proportions, so that a pinnacle looks like a peak and a short drop like a bottomless precipice. On wide snowfields the cloud blanket is very embarrassing for keeping direction and it is often necessary to shout and use the return echo to guess where you are.

Storm clouds on the other hand are very objectionable. Sometimes they are highly charged with electricity. Then the nearby rocks begin to hum, ice-axes to buzz, and, if you remove your hat, your hair will stand straight up on end. When surveying, I have several times received a severe shock through touching the screw of a mountain transit-theodolite while it was buzzing. There is no real danger in this sort of cloud, but thunder clouds highly charged with electricity, which bursts forth in lightning flashes, are very dangerous and have been known to

cause a loss of life to mountain climbers. Think of a bad thunderstorm in your home locality, with the crashes directly overhead; now move up to the summit of a high peak, where the clouds that caused the storm are actually at your level. The result is that you are in the middle of it, and you can well imagine how terrific it must be. It is not an unusual occurrence, when at the summit of a peak to see a fierce thunderstorm in full display beneath you, while all around at your elevation the sky is clear and the sun shining brightly.

The writer and his survey party had a very uncomfortable experience of such a thunderstorm during the summer of 1915. We were at the summit of Goulds Dome in the High Rock Range, a sub-range of the eastern escarpment of the Rockies, south of the Canadian Pacific Railway's main line. Thunder clouds were seen approaching and the ominous crash and flashes of lightning came nearer and nearer. Quickly they were all around and a splitting crash overhead warned us off the crest of the mountain. I called my companions together and we descended about thirty feet. Hardly had we done so when a bolt of lightning struck the rocks within forty feet, sending a puff of rock dust into the air. Another was seen to strike far below, accompanied by a puff of smoke like a bursting shell. A few minutes after, Gordon, who was sitting close to me, leaped up and clapped his hands behind him, exclaiming: "Oh, Lord!" I well knew what had happened him, for I, too, had felt the shock. A bolt had struck the top of the peak close by and electrified the whole of it. It was instantly followed by an ear-splitting crash, far more awful but less deadly than the lightning. We had scarcely realized that no damage was done, when with a wicked sizzle a flash of lightning appeared to fork completely around us and I felt a severe electric shock all over. The storm seemed to hang around the peak for an infinity of time as we sat with our coats over our heads,

for it was pelting hail, and waited for what might happen. Presently it passed and the sun shone clear and bright, but I am free to confess that I momentarily expected that one or all of us would be killed by the lightning. The peak, 10,169 feet in altitude, is the highest of the range and is undoubtedly a storm centre, for day after day, about the same time thunder clouds were seen to gather about its crest and the lightning encircle it.

Only two days before we had made an ascent of the peak from the opposite side. It was a bright sunny morning when we started and we did not take coats. Having reached the required spot (not the summit) and done our work, we started to descend. We noticed that it had become very dark but, busy with the difficulties of the descent, had paid little attention to it. Suddenly a roar, like that of a giant waterfall, far below drew our attention and we saw that the entire lower part of the mountain was hidden by a dense white cloud, from the centre of which the roar emanated. It proved to be a cloud burst and sheets of hail were falling. Gradually it worked upward and we were enveloped in it. We had reached a little depression between a precipitous wall of thirty or forty feet and a long snowslope by which we had ascended. The hailstones were as big as small marbles and struck our almost bare backs with stinging force. Here we crouched at the base of the rock and awaited events. Soon things began to move; single stones came leaping from above and, missing us by inches, shot down the snow-slope at vicious speed. The single stones became fusilades; rock falls crashed all around; what had been trickling streams when we ascended were now roaring torrents and we realized that the mountain had run wild. It was freezing cold and, as our chances were none too good where we were, we decided to take them on the snow-slope and get to a place of safety. So we descended as rapidly as possible and by the time the bottom of the slope was reached the storm

was over and the sun shining. But what a sight! The mountain was a great white mass; piles of hailstones lay everywhere; sheets of water were coming down the slopes and pouring over the ledges; torrents were raging down the gullies and loosened masses of rock were still falling. I had never seen a mountain run wild before and the sight was one I shall never forget.

Spectre of the Brocken

This phenomenon is supposed to belong exclusively to the Harz Mountains of Germany. Notwithstanding, I have seen it several times in the Canadian Rockies and have heard of it being seen several times more.

The conditions upon which it is dependent are a nearby bank of cloud and the sun behind the observer in nearly the same plane. Thus, the shadow of the spectator is thrown on the cloud. If close, it is a small, black, sharp-cut representation; if distant, it is huge and not sharply defined, giving the impression of a mysterious giant form. It is surrounded by a circular disc, composed of the prismatic colours in regular order, vivid if the shadow is close and faintly defined if distant. My first experience was on Sentinel Mt., a peak of the Highwood Range, overlooking the prairies of Alberta. I had been working there with an assistant, an Irishman from Cork. A dense bank of cloud had formed from nowhere in particular and had settled along the edge of a precipice above which we were standing. You could put out your hand and touch it. Suddenly, as the sun in the west dropped to our level, each saw his own shadow, like a sharply defined mannikin, in the middle of a circle of rainbow colours about a yard in diameter. It was very funny, every movement was accurately portrayed by our double on the cloud bank. The Irishman was astounded and proceeded to execute a jig for the pleasure of seeing how his double did it. He took off his hat to the shadow, who returned the compliment, and made a number of con-

temptuous gestures which were instantly repeated. At last he exclaimed: "Begorra that's foine! I wonder would it go away if ye threw a sthone at it." The conditions creating this form are probably rare and the more frequent exhibit is in the shape of an immense shadow on a more distant cloud, giving the impression of something weird, mysterious and spectral. Each person can only see his own shadow, so that descriptions of the spectre are liable to vary when seen by more than one person at the same time, thus adding to the mystery. The prismatic circle is called the "Brocken Bow."

Rainbows

By no means least interesting are the rainbows, which are seen in every grade of intensity and in every conceivable position: great coloured arches in the sky, bridging wide valleys, spanning narrow gorges, above, below, almost at hand, where the traditional pot of gold seems within reach.

Again referring to the summer of 1915. While on a peak across the valley of Dome Pass, exactly opposite Goulds Dome, we were favored with the most perfect exhibition I have ever seen. The customary afternoon thunderstorm had centered around the Dome and was passing to the northward, leaving the valley between filled with black gloom. A break in the clouds and the sun shone out, and then, on the opposite side of the valley, appeared a giant double circle of intensely vivid prismatic colours—the rainbow and its reflection, the reflection being very nearly as brilliant as the original bow. In this case it was a complete circle except for a small portion at the bottom of the valley where the crest we were on cut off the sun. Directly in the centre of the double arch, as in a frame of many colours, the black silhouette of Goulds Dome stood alone. It was a wonderful and unique spectacle, weirdly intensified by the black gloom of the passing storm.

In the Gordon Canyon, above Bow Lake, is the very narrow and deep rock canyon. The walls are so close that a single boulder fallen from above has furnished a natural bridge. A glacial torrent flows through this crack in the rock and, at a certain place, there is a perpendicular fall over a ledge. Below the fall is a pothole, formed by the swirl of the water, and the tiny chamber is filled with mist. It is possible here to climb down to a ledge below the fall and when standing on it the walls approach closely and overhang, so as to shut out the daylight except from a single small opening in the rock. I happened to stand on this ledge just as the sun came opposite the opening, and immediately a tiny rainbow formed across the pothole chamber and rested one end of its arch upon my feet. One of my childhood's beliefs had been, that if you could reach the end of a rainbow you would find a pot of gold. It was rudely dispelled. The end of the bow rested on my feet, but alas! there was no pot of gold.

In the canyon of Moose River, not far from where it opens to the Grand Trunk Pacific continental railway line, a few miles west of Yellowhead Pass, is a place where you are between two falls. The upper one drops fifty feet, the lower twenty feet. Here the awe and grandeur of the canyon culminate, the rock walls descend sheer, mist and spray fill the gorge and eddy between the walls continuously. While I was there, it was a bright sunny day and I counted six baby rainbows playing hide and seek in the swirl of vapour.

Any number of examples might be quoted, but the above will suffice to illustrate a phenomenon that, while seen everywhere, is of special variety and interest in the mountains.

Those of our members who read this will, no doubt, call to mind many other meteorological phenomena that have come to their notice, or other phases of those that

have been touched upon, and the photographers among them will have many wonderful examples of cloud forms. In these outlying wilds of Nature only extremes are met with: it is either too hot or too cold, too wet or too dry, the creations are very beautiful or grotesquely ugly. It is probably for such reason that we find them so attractive and turn to them again and again as a relief from the prosaic routine of everyday existence.

MISCELLANEOUS SECTION

MT. ALEXANDER MACKENZIE

By Mary L. Jobe

Mt. Alexander Mackenzie is the name recently given by the Geographic Board of Canada to the magnificent, newly explored peak at the headwaters of the Fraser River in the northernmost Canadian Rockies. It is approximately 120° 10′ W. Longitude and 54° N. Latitude, and has been heretofore variously denominated the "Big Mountain," "Mt. Kitchi."

My 1914 expedition, described in the 1914-1915 Canadian Alpine Journal, Vol. VI., pp. 188 to 200, under the title "The Expedition to Mt. Kitchi: A New Peak in the Canadian Rockies," had created an intense desire to explore this great glaciated peak again. Accordingly, during the late winter and early spring of 1915, I planned my second expedition to this mountain, again arranging for the guidance and outfit of Mr. Donald Phillips, of Jasper, Alberta. My companions were Miss Caroline B. Hinman, of Summit, New Jersey, and Messrs. John, Arnold and David Tyler, of Brooklyn, N.Y., all with considerable mountaineering experience. Frank Doucette, a second guide from Jasper, and a cook, Joe Soper, accompanied the expedition. The 1st of July, the outfit of twenty-three horses met us at Robson Station, and from there we started on our old trail into the North Country.

Our general line of travel may be described as follows: Starting at Robson Pass, the route lay north down the

valley of the Big Smoky, beyond the mouth of Wolverene Creek, to the mouth of Glacier Creek ("Bess Creek," Collie and Mumm); thence up this Creek, across Bess Pass, Bess Shoulder and Jack Pine Pass; from the valley of the main Jack Pine to the Middle Jack Pine, and thence directly to the West Jack Pine. From this river we again travelled to the Fraser Smoky and thence to Crescent Lake Pass, as in 1914. Beyond this point, we changed our course, crossing the head of Forget-me-not Creek, travelling north to the well-known Indian trails on Sheep-Creek Pass and the Porcupine. Skirting the headwaters of Providence Creek, we travelled generally near the Divide and finally approached the Big Mountain from the northeast, where we camped on the flats below the moraine of one of its big glaciers. From Mt. Alexander Mackenzie, we travelled north to Jarvis Pass, and crossed a pass to the Wapiti. This was our "farthest north." Returning via Jarvis Pass, the Porcupine, Providence Valley and Sheep-Creek, we crossed to the Muddy, which we followed to its mouth, rafted the Big Smoky below the mouth of the Sulphur and followed the old Indian trail to Grand Cache. From this point we travelled up the Sulphur, crossed Hardscrabble Pass to Rockslide Creek, and again struck the Big Smoky near the mouth of Short River ("Glacier Creek," Collie and Mumm), and thence returned to Robson Station the 1st of September.

From the time we left Robson Pass until we crossed the West Jack Pine, we had unsettled weather. Beyond the west branch we made an attempt to skirt the headwaters of the east branch of the Fraser Smoky, and thus avoid the difficult travel through the dense British Columbia forests, which had given us so much difficulty in 1914. To this end we left Avalanche Pass and our 1914 route far to the westward, and crossed a high ridge to the north. Here we saw many kinds of small animal life: blue grouse, in the small balsams at tree line; ptarmigan, in the higher heather slopes; gophers,

whistlers and conies among the rocks; from a meadow in the burnt timber a white-crested sparrow sang his plaintive song as he flitted to and fro among erigerons and painted cups; high up on a snowfield juncos flew about excitedly at our approach; while, rarest of all sights in this north country, two robins hopped about on a green grassy slope. One flew to a little scrub balsam and there sang his spring love song as if he were the first robin of spring, poising on the topmost branch of the tall maple in the pasture. These were the only robins we saw on the trip; but at almost every one of our camps the little white-crested sparrow greeted us with his minor strain: "Come see me," he sang invitingly.

Just as we reached the crest of the ridge a storm of rain and hail broke over us, and, as we began our descent on the other side, a dense cloud enveloped us. It was impossible to see more than ten feet ahead as we made our downward progress over 1,000 feet of shale and alpland. After making camp, the rain soon turned to snow. From July 9th until July 14th, we were "snowed-in" in Stormy Valley. As the snow lay three or four feet deep we were unable to move our outfit, or even to travel on foot any distance from camp.

From the little scouting ahead we had been able to do, it was obvious that this new route would not offer any advantage over our 1914 route. Dense woods filled the high valleys ahead of us; travel along tree line was impossible, because it was both circuitous and difficult. On July 13th, Phillips started out alone on a two days' reconnaissance, and on the 14th the remainder of the party made the ascent of Lone Mountain, a high rocky peak we had located in 1914. It is remarkable because it is quite isolated and rises suddenly to an elevation of about 9,000 feet from densely forested low mountains which encircle it. The peak itself is a mass of grayish-greenish-black rocks, all moss-grown and beautiful in color. From the top we could see the Big Mountain

quite plainly through the glasses, although it was cloud-hung. Mount Ida, too, was clearly visible, with a great stretch of ice and snow extending between it and its giant neighbor. The same bands of rock strata, alternating with bands of ice, were visible on both peaks even at this great distance. Near at hand the Black Twins and Crescent Lake stood out fine and clear. To the southeast, Jones Peak and Jack Pine Mt. were in plain sight, but there was no trace of Mt. Bess or "Mt. Chown." The view to the northeast was across miles and miles of forest—"a visioned valley, with a green stream streaking through it"—the main east branch of the Fraser Smoky, near its source. In one of the little side valleys, several miles away, a big open meadow appeared. Doucette's keen eye spied moose. "Where?" He told us: "Near a patch of snow." On looking through the glasses, the moose proved to be horses—seven of them—the patch of snow, a clean white tepee. "Probably Donald McDonald and his wife who are in from the Muddy on one of their hunting trips," said Doucette. Whoever they were, it was our only glimpse of other wayfarers on our entire trip. It seemed too bad to pass by without greeting them!

While still above tree line, on our descent, Doucette sighted caribou—the glasses showed nine—feeding in a brownish-green spot in an open meadow where the winter's snow had only just melted. We approached nearer and nearer to them, fearful each moment lest they get wind of us and run. However, we advanced within twenty-five yards, photographed them, and finally walked into the herd before they chose to move. Two of the men shouted loudly just to see them run. They did—in a moment they had vanished among the trees. On the other side of the meadow we met Phillips returning from his two-day trip to look out a route to Sheep-Creek Pass. He, too, had been watching the caribou for more than an

hour, and had been lying on the hill in the sunshine in plain sight of them.

Phillips found there was no better route out of the valley than our old route to Crescent Lake Pass. Accordingly, the next day, the snow having disappeared in one day of brilliant sunshine, we retraced our steps to the crest of the ridge. After travelling several miles to the end of this ridge we picked up our 1914 trail. In company with Miss Hinman, I had gone ahead of the outfit in order to get some compass bearings from a point above Avalanche Pass. To my surprise I found the 1914 hoof-prints of our horses still quite distinct in a clayey side hill, despite the fact that they had probably been under snow for at least nine months. Fifteen hundred feet below we forded the Fraser Smoky and again took our outfit up the twenty-four switch-backs on the opposite side of the valley to Crescent Lake Pass. The previous day Phillips had spent nearly ten hours cutting out these switch-backs. "If each year the trees fall in as great numbers as they have during this past year, soon no forest will be left standing," was his remark.

The descent from Crescent Lake Pass seemed steeper than ever, and our heavily packed horses took it on the run, while our old camp site in the valley below seemed even more beautiful than before. Here is a perfect gem of a mountain stream! Crystal-clear, cold water runs laughing and gurgling over mossy brown-green rocks, and falls into deep, dark pools. Heathery slopes, starred with anemones, lead up into a dim, dark forest. The witches are in this little stream—sprites of gladness and joy! They call to you, and laugh at you, and make you love this spot as you have loved no other. They tug at your heartstrings as you go. You have left a friend behind!

From this point to Alexander Mackenzie, we did not again strike our old trail. We crossed two ridges to the

headwaters of Forget-me-not Creek. Beyond the second ridge we came to a chain of lovely clear lakes, far above tree line, and each one fringed with forget-me-nots of a most brilliant hue. From the headwaters of the north fork of Forget-me-not Creek we crossed the Divide to the south fork of Sheep Creek, where we came upon an old Indian camp ground with three large drying racks, indications that a big kill had been made there in the days when the Indians ruthlessly slaughtered and consequently exterminated much of the big game. We picked up their old trail on the Divide and followed it until it became buried under the debris of burnt timber. The Indians had not been in since the forest burned—the fire having been caused, doubtless, by their own carelessness in leaving their camp fires smouldering. How little the Indian knows of conservation! And how little of the fundamentals of self-preservation! To burn out the forest as he does means the extermination of game, and oftentimes the destruction of his own livelihood.

We soon got above the burnt timber. Travelling above tree line is always satisfactory. From our high elevation, we could plainly see the main valley of Sheep Creek, and below us a well-defined trail. This we picked up and followed down over bench-land and through broad, dry meadows to an old Indian camp ground near Sheep-Creek Pass, where the main trail from the east joins the south trail. Doubtless the Indians had camped here for generations; drying racks in various stages of decay were on all sides; any trees had been cut for firewood. It is a beautiful camp site. Miles and miles of broad meadows stretch from east to west, while a camp could be pitched in any one of a dozen different places and each with fine prospect of mountain, stream and valley, and with horsefeed enough to keep horses in condition indefinitely. This same camp ground had been used by Mr. S. P. Fay in 1912 and by Mr. Fay and Mr.

C. R. Cross in 1914 on two expeditions described by Mr. Fay in the 1914-1915 Canadian Alpine Journal.

From this point we found easy going to the Porcupine, past "Surprise Lake" and on to the headwaters of Providence Creek. From the camp we climbed a low peak to the north which gave a fine view of a wide expanse of country. Beautiful lakes were here on all sides, some were large and filled the valleys; others were only tiny tarns in the hollows of the hills—but each mirrored some rocky pinnacle, or glacier-hung peak. The Big Mountain dominated everything, Mt. Ida and the two glacier-clad peaks between looming up high and clear; the whole western landscape afforded a wonderful array of glaciers, snowfields and towering peaks.

After crossing the Divide west of the headwaters of Providence Creek we left the trail followed by Mr. Fay, and travelled almost due west, camping about five or six miles distant on the shores of one of the lovely lakes we had seen from a shoulder of the Big Mountain in 1914. They had been named Margaret and Mariel by Phillips, who, because they seemed such tiny things at that distance, had ventured to suggest personal names. "Mariel," as the northernmost one was designated, is north of the Divide, and drains into the Porcupine. We found it a fine expanse of water. From its western shore, there is a fine vista of mountains, and the reflections in the evening light are not easily forgotten. Extending westerly and southerly from this lake, are broad open meadows, almost as flat as a table and dotted everywhere with balsam trees whose branches grow so close to the ground it is almost impossible to creep under them. All the banks of the lake are gently sloping and there is a clean gravelly bottom. "Lake Margaret" is south and west of the Divide. It has no pronounced southern outlet, but there is a spill-over, which drains into a Big Salmon tributary. It is almost the exact opposite in appearance and character of the other lake. Forests

grow on all sides to the water's edge. In fact, it is easy to approach within a few yards of the lake and not be aware of its existence. On one side a high mountain rises abruptly from the water. The shores are filled with huge boulders, and the bottom drops off abruptly in some places to great depth. So completely shut-in is the lake that we found it impossible to get a photograph of the entire sheet of water. From the broad meadows of the northernmost lake, we had a splendid view of the Big Mountain. It seems only a short distance away, but it is easily six or seven miles to its base. The old Indian trail continued from the shores of one lake to the woods skirting the other. Cuttings many years old were visible in many places. Here, too, we found a remnant of an old camp-fire made, perhaps, ten years ago. This valley was obviously the terminus of the old Cree trails, and had been used less frequently than the main thoroughfare from Sheep Creek to Jarvis Pass, due doubtless to the density of the forests on the British Columbia side.

Continuing through the woods, we crossed a very steep side-hill, and came out upon an alpine summit. Here we had a magnificent view of the northeast face of Mt. Alexander Mackenzie. The main peak shot up brilliantly into the sky, while below the great masses of glacier shone resplendently.

Beyond this summit we took our outfit down an abrupt descent of at least 1,000 feet over wind-falls and through rhododendrons and alders. The wooded hills seemed to come together in a deep gully. From above, it looked as if we would not get our horses down at all, or, once down, that we could not find a camp-site. The first belief proved incorrect, for we did reach the bottom of the valley, with no greater disaster than that of continually plunging knee-deep into mud; but, finding a camp-site was not so easily accomplished. Once out of the timber we came into a broad muskeg-meadow. This we followed for a distance of two miles into a narrow

rock-hung defile, at the head of which one of the branches of the Big Salmon is born. Glacier moraine and steep wooded slopes fill the upper valley. The river is of fair size. It branches and flows in various channels across the boulder-strewn willow flats. These boulders are all huge, newly-displaced rocks, swept down by recent, powerful snowslides.

After searching up and down the valley for a good camp-site and not finding one, we finally pitched our camp on the willow flats at the foot of the moraine. Here, on rough, stony ground, we made a permanent camp. All hands turned out to render comfortable a spot in which we anticipated spending several weeks. A bridge was constructed across the stream to the woods from which came our supply of fuel and a fine table of split logs with log seats was built.

As we had made camp in a violent thunderstorm—sleet and snow had raged about us for an hour—we named this valley "Thunder Valley," and the ridge separating us from the main peak of the Big Mountain, "Thunder Ridge." Our camp was at the northeastern base of the outlying ramparts of Mt. Alexander Mackenzie.

After making several reconnaissance climbs on nearby points, we made our first attempt to climb the Big Mountain on July 25th. The climbing party consisted of Phillips, Miss Hinman, John Tyler, Doucette and myself. We left camp at 4.30 and after travelling half a mile up the valley toward the southwest, climbed 600 feet up a snow couloir, above which we found excellent rock climbing. Leaving the rocks, we came out on a very steep, hard snow slope, in which Phillips had to cut steps. Above this we reached rocks, and then a big snowfield flanking the north side of what we last year called the "Menagerie Glacier." At the top of this first escarpment, we saw the great panorama of cloud-

hung peak and intervening icefields stretched out before us. We were viewing it from the northeast.

For about half a mile we travelled westward along a rock ridge to a snow col, separating the Menagerie Glacier from the big glacier which forms the main source of Thunder Creek. This second glacier, which we had barely caught a glimpse of in 1914, we named Castle Glacier, because the ice here assumes a peculiar castellated form, and a big rock mass which rises above the ice, likewise has the appearance of many strong castle towers. At the west end of the col we climbed over the cliffs to the left and came out on the glacier, well above the maze of crevasses we crossed in 1914. On either side it is flanked by hanging glaciers and by ice-falls. It was at this point we were compelled to turn back on our first attempt in 1914, on account of a heavy snowstorm. We next crossed a half mile of level glacier and snowfield and then climbed a steep snow-slope to bare ice, filled with crevasses for a short distance. Here, again, as on our second 1914 climb, we saw many little dead birds, and we also noticed on one of the snowfields tracks of a big grizzly.

Above the crevasses we had good going to the summit of the second escarpment and to the cairn built on our *second* attempt in 1914. From this point the big main glacier, which I have called Kitchi Glacier, slopes away for miles to the west and southwest. It receives the constantly avalanching snows from the north face of the peak, and from a very long ridge which extends for a considerable distance to the west of the main peak. The Kitchi Glacier forms one of the important sources of the south fork of the Big Salmon.

While eating our second breakfast at 9 o'clock near the cairn, the clouds which had enveloped the peak all morning lifted and revealed a huge ice mass, clear white against a bright blue sky—a great, overhanging, broken

cornice which forms the extreme summit of the main peak itself, girded on all sides by sheer ice cliffs, and here and there bands of perpendicular, black rock cliffs protruding from the green-white of the mighty mountain itself. The whole face of the mountain was streaked and torn by avalanches. Phillips, John Tyler and Doucette decided to investigate a route along the northwest arête.

I here quote from Phillips' diary:

"It was 9.45 and we were still nearly two miles from the northwest ridge which we decided to try to climb. The safest route seemed to be by way of the glaciers to the southwest, but as this would mean six or seven miles over snow and ice, we decided to go straight across the glacier and up a very steep snow-covered glacier, between two icefalls. We made good time to this point, but there found terribly steep snow-slopes into which we plunged above our knees. Great crevasses, some a hundred feet deep, and too wide to cross spread out before us. These we had to work around or cross on snow-bridges, walking on hands and feet to distribute our weight evenly. After about two and a half hours we reached the foot of the steep snow-slope below the main ridge. Here we chose for our ascent a space a hundred feet wide, which was safe from slow-slides. Reaching the first rock cliffs, our really dangerous climbing began. The spaces between the cliffs were filled with snow, which at that time of day was wet and ready to slide at a single touch. It had to be scraped away down to the rocks. These, unfortunately, were poor footing as they all sloped the wrong way at an angle of about fifteen degrees. The danger of snow-slides became so great at an altitude of 9,000 feet that I decided to turn back. We still had several hours of climbing to reach the summit and all our steps below I knew would be covered, for we had kept a steady avalanche of snow and rocks going down as we climbed. At 4 p.m. we reached the last cliffs, and knowing it inadvisable to go again between the

ice falls, we returned by the glacier and snow-fields, which required about three and one-half hours. We found the remainder of the party anxiously awaiting our arrival, as they had seen us come down from the ridge to the snowfields, turn to the southwest, and there had lost sight of us for three hours."

For Miss Hinman and myself, who had decided not to attempt the final climb—so long and dangerous had the ascent seemed—the day passed as if we were watching a drama on a vast stage, with actors in as thrilling a part as was ever played. So intense was our interest, that the time for us passed quickly. Just *nine hours* after they left us, they appeared on the glacier within call. It was sunset. Great black clouds rolled up in the northeast. It suddenly grew black and overcast, a biting sleet fell and a high wind screamed about us. "We must hurry down over the glacier before the storm reaches us," Phillips had said. As we travelled quickly down over Menagerie Glacier, a wonderful rainbow showed against the purple-black clouds ahead of us. The smouldering fire of the dying sun flamed up for a moment and gilded and reddened the peaks off to the northeast. The glaciers and snow-fields caught and for an instant reflected the afterglow.

We descended to the snow col, skirted Castle Glacier and traversed the big rock-fall beyond, and shortly after dark again reached our camp in Thunder Valley. It was July 25th, just eleven months to the day since Phillips and I had tried the mountain alone.

The next few days we spent in an exploration of the lower valley and in determining the course of three branches of the south fork of the Big Salmon. A second attempt on the Big Mountain was now being eagerly discussed. As it had required eighteen hours of exhausting effort to make the partial ascent of July 25th, Miss Hinman and I decided not to attempt the ascent a

second time. Obviously greater endurance and strength than we possessed were requisites for such a climb. "It's a man's size mountain," Phillips had declared, and we were not disposed to contradict him.

Accordingly, on August 1st, Phillips, J. Tyler and Doucette again started for the peak, this time choosing as a route the only part of the mountain not swept by avalanches, the northeast, "knife-edge" arête, which had appeared so forbidding to us last year. The climbers were off at 4 a.m. following our route of July 25th to the head of Menagerie Glacier. Miss Hinman, Arnold and David Tyler and I climbed Thunder Ridge — the ridge directly opposite camp—from which we commanded a fine view of the peak. As we were gazing at the mountain in the hope of catching a glimpse of the climbers, I remarked that there was one place on the northeast arête which looked like a great rope stretched across a snow-couloir, while a big black rock at one side looked like a black giant holding the rope. David Tyler who then had the glasses spied the climbers going up a steep snow-cornice to the main arête. On closer examination we could trace their route, back to the "giant's rope," which proved to be steps—forty of them, we learned later—cut in an almost perpendicular icewall. For three hours we watched them, fighting for every step up that terrific slope. In the middle of the afternoon big thunder clouds rolled up from Providence Pass. They soon enveloped the Two Towers, and although the worst of the storm was spent the clouds eventually drifted across the mountain top.

For the real story of the climb I again quote Phillips' diary:

"This time, we decided to try the northeast arête as it seemed less difficult and the highest part of the ridge of the peak is at that end. There was at least a possibility that we might be able to get over the three cornices to the highest point. At 8 a.m. we reached the foot of

Photo, Donald Phillips

THE MAIN PEAK
Line of Ascent by Northeast Arête
x, Highest Point reached, Aug. 1st

Photo, Donald Phillips

THE CHIMNEY

the arête and started up the bare rocks. At a distance these rocks looked solid but they are really very much broken and need only a touch to topple them over, and send them crashing to the glacier below. Our progress was necessarily very slow, as we had to keep close together to avoid falling rocks. Much of the broken rock had to be removed from the ledges. One chimney in particular all of us had to go up close together and get our heads above the top, before any one could get out, because the edge was covered with loose rock ready to slide down in an avalanche. After climbing up seven or eight hundred feet of this rock we reached the first snow and ice.

"We had expected to go to the right over a very steep snow and ice ridge where cutting several hundred steps would have been necessary, but we soon found that we could keep to the left on the rocks at the edge of the cornice, and would have fewer steps to cut. Forty steps we cut across a very steep ice-couloir, and then climbed up a steep snow-ridge to the top of the cornice coming out above the steepest part of the main snow-ridge. Even here the slope was appalling in its steepness, going out of sight a few feet below our line of travel. The snow was deep enough for good footing and we soon got up to where it was not so steep. Here, however, the snow was shallow on the ice. A thunderstorm was raging in the valley to the southeast, and we expected every moment to be shut in by the clouds. The storm gradually drew away to the eastward and the sun came out again.

"At the upper part of the snow, we struck some bad snow and ice between small, outcropping cliffs, but finally got out on the rocks of the ridge once more. Here the rocks were much better climbing and of a different formation, not being so broken as they were below. We now made good time, striking only small patches of snow and ice until we came in sight of the peak—a great ice-cornice hanging over the north side of it and the upper

part curving in a great hook over to the southeast. Apparently there was no way of getting to the top without great risk but we determined to get as close as possible at any rate. We kept on going until only two cornices separated us from the highest point—a distance of about 100 feet above us. At this moment the clouds shut down, and a gale of wind struck us. We had to take shelter behind a snow-cornice where we crouched for half an hour hoping for a break in the clouds, so that I could at least take a photograph of that terrible, hooked cornice which formed the main peak such a short distance above us. The clouds did not lift and, half frozen, we started back down the mountain.

"Whether we could have gone any further—if the weather had been fair — or whether we could have climbed the last few feet of the hooked cornice is problematical. Almost straight walls of ice covered with rotten snow and ice form these cornices." (These are the big ice caves with depending icicles which I have described in previous articles.) "The snow on the peak is not hard enough to kick steps in. It has to be scraped away and steps cut in the ice.

"The mountain is not as high as many have estimated it to be. Some have even estimated it at 12,000 to 12,500 feet. In 1914 we estimated it at not over 11,000 feet. In our 1915 climb our aneroid read a little under 11,000 feet.

"Mt. Robson is higher and more spectacular, but I found nothing on it to equal the danger of the treacherous snows and rotten cornices of Mt. Alexander Mackenzie."

We were glad indeed to have a reunited party at our camp that night and to hear the story of their climb—a much more dramatic and humorous narrative than is recounted here, for such a story can be told only once, and that immediately after its enactment and by the participants themselves.

In summary: Mt. Alexander Mackenzie is undoubtedly the culminating northernmost peak of the Canadian Rockies. Its snowline is very low. Its glaciers extend far below tree-line. The average elevation of the terminal glacial moraines is approximately 4,000 feet. The area of ice surrounding this peak is enormous. It is easily thirty-five square miles and contains the main sources of three large branches of the south fork of the Big Salmon. The lower towers and ridges of the mountain are all acutely pointed and consequently retain little snow. The snow on the mountain is in constant state of avalanche. I counted five big avalanches at one time, all in plain sight on the north face of the peak. At close range, these avalanches sound like heavy thunder; at long range like the roar of distant artillery.

Mt. Alexander Mackenzie is a magnificent peak. It gives the impression of a singular grandeur, largely because its formation is so diversified. The south face, the east face and the north face are all distinctive. Its numerous glaciers are varied in color, shape, character and extent. The rock strata of its outlying ramparts are beautifully colored. Its debouching rivers are mighty and numerous. It is a complex thing and might well be called the Mountain of a Thousand Wonders.

From our base in Thunder Valley we took the trail north to Jarvis Pass, where as early as 1875 E. W. Jarvis, in a long surveying expedition, in which he travelled from Ft. George to Lake St. Anne, found this pass between the Fraser and the Porcupine. He came up the Fraser in the dead of winter bringing with him eight men and six dog trains with provisions for two months. He had to send part of his men and dogs back to St. George. In the late winter many of his dogs died. He travelled over 900 miles on snow shoes. The last 300 miles he carried a pack, making never more than ten miles a day. His locating this pass was a splendid achievement.

Our well-conditioned cayuses, now well fed and well rested after their long stay in Thunder Valley, afforded us a speed of travel which practically doubled that attained by Jarvis and his dog-teams. From Jarvis Pass, we continued to Mt. Ida and the head of the Wapiti, climbing several minor peaks, one a most interesting peak which we named "The Chimney." In its lower abutments eight fine rock chimneys occur. It gave us a fine view into the Big Salmon Valley and into the Wapiti. The latter survey gave us the conviction that we did not want to go further. Across the watershed the mountains grow perceptibly lower and the country has a desolate appearance.

Retracing our steps to Jarvis Pass and the Porcupine, we dropped down into Providence Valley, where we camped for several days and explored the valley rather thoroughly, locating many fine waterfalls, lakes and an impressive canyon. Returning to Sheep Creek, we travelled eastward to the Muddy which we followed to its junction with the Big Smoky. A day's travel below the confluence of these rivers, we swam our horses and rafted our entire outfit across the Big Smoky, making the ferry of one-half mile in three and one-quarter minutes. From this point we followed the Indian, Evan Moberly's trail to Grand Cache, then travelled up the Sulphur across Hardscrabble Pass, beyond which we again reached the Big Smoky.

On our way out to Mt. Robson we climbed Mt. Bess, the first ascent of which had been made by Collie and Mumm in 1912, which, I have been informed, was along the western arête. Our ascent, the second, was up the south face, and therefore probably the first ascent by that route.

Collie and Mumm estimated the elevation at 11,300 feet, but our aneroid registered only 10,500 feet a little above their cairn. Mr. A. O. Wheeler computed the

altitude of this mountain from trigonometric levels based on the levels of the Grand Trunk Pacific Railway. His results gave 10,468 feet. The ascent of the peak proved interesting and in only one place difficult—a fifty-foot cliff, not far from the summit, which extended for a considerable distance around the mountain.

On the 1st of September we again reached Robson Station. It was with much regret on the part of each member of our party that our two months' trip came to a close.

In conclusion: I wish to express a deep sense of personal gratitude to Miss Caroline Hinman, who proved a splendid companion and contributed constantly to the success and enjoyment of the expedition; to John, Arnold and David Tyler, keen for every new experience and resolute in their desire to make the best of every hard circumstance; to our cook, for the best trail food I have ever eaten; to Frank Doucette, our "whirlwind of a packer," a strong and careful climber, and a most genial spirit on the trail; last and by no means least to Donald Phillips, whose unerring judgment and fine mountaineering and trail ability led us to our goal, brought us out of all difficulties without mishap and, in fact, made possible our 1914 and 1915 expeditions to Mt. Alexander Mackenzie.

MEMOIR OF THE LATE HAROLD W. TOPHAM

By H. E. Forster

Mr. H. W. Topham, of the English Alpine Club, who died last year, may be considered the earliest mountaineering pioneer of the Selkirks. In March, 1888, he visited that district with his brother—Caleb and Joshua, spying out the promised land. It was in the summer of that year that our honorary member, Mr. W. S. Green, made his historic explorations recorded in his classic book, "Among the Selkirk Glaciers."

Mr. Topham received his mountain training in Switzerland under some of the best guides of his day. His climbs were numerous and many of them of the first rank. He was a good comrade and a good mountaineer.

I was exceedingly sorry to hear of his death as I had the pleasure of making my first visit to British Columbia in 1890 with him and spending many happy and strenuous days in his company exploring the Selkirk Mountains. As Mr. Wheeler has asked me to write a few lines in memory of my friend and companion of this interesting summer I will endeavor to give a brief outline of our expeditions together that year.

It is so long ago, however, that it is difficult to remember details and even the proper sequence of some of our explorations. We were both staying at St. Moritz in Switzerland the previous winter for the winter sports, and it was there that Mr. Topham proposed that I accompany him on a trip he was contemplating in the summer of 1890 to the Selkirk Range of British Columbia.

He had a year or two before been in this province and had made a short expedition to the mountains in the

interior of Vancouver Island, and I well remember his description of the difficulties of travelling through the thick underbrush and heavy timber of the Island.

His main expedition that year, however, had been to Mt. St. Elias in Alaska in company with two or three friends, where they succeeded in reaching an altitude of nearly 12,000 feet on this mountain. Unfortunately they had to turn back at this point, so he told me, owing to the fact that from where they were to the summit was a steep ice slope, to overcome which would have necessitated several days' step cutting and camping at night on the steep mountain side, which was more than they were prepared for. Since Topham's attempt I understand an easy route has been discovered to the top of Mt. St. Elias from the other side.

After making some preparations in London we crossed the Atlantic together in May to New York, where we separated, to meet again in June at the Glacier House.

Topham had arrived a few days earlier than I and had employed the time crossing the Asulkan Pass in company with two so-called guides, but who made no pretence of being mountaineers, and making first ascents of Mts. Donkin and Fox of the Dawson Range. It was from the latter mountain that he had looked down into a beautiful mountain valley surrounded except for one narrow outlet by glaciers and precipitous rock walls, which he called Glacier Circle. He decided this would be an excellent camping ground from which to explore the surrounding mountains. Accordingly, a few days later, with the two guides Sinclair and Eves, we crossed the Illecillewaet névé and descended into Glacier Circle.

From this camp we climbed Mt. Deville as it was then called, but which has been since renamed Mt. Selwyn, owing to a peak in the Main Range having already been named Deville. This I remember was a long climb, as we had to first find our way up the steep rock wall on the

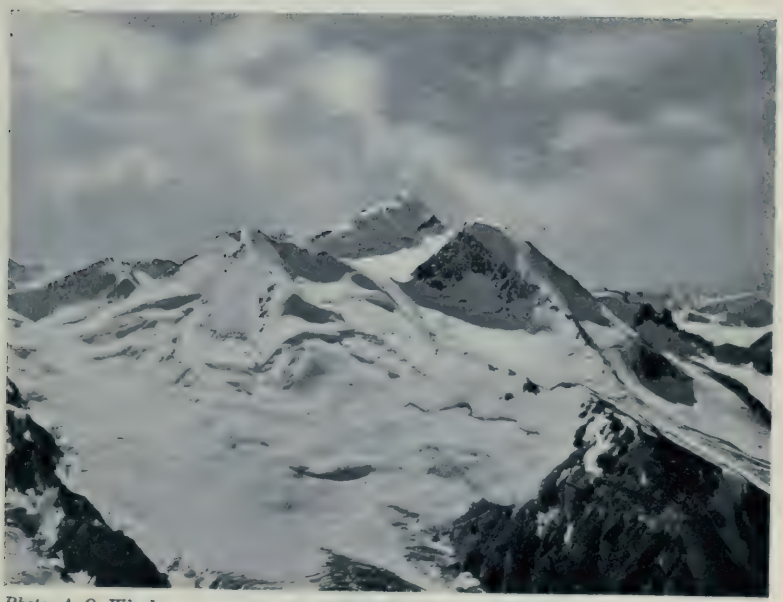
west side of the Deville icefall and then ascend the mountain by the arête leading up from Deville névé and although we started at 5 a.m. it was 3 p.m. before we reached the summit. If it had not been so late in the afternoon we would have gone on to the summit of Mt. Dawson, apparently an easy walk over snow, but we remembered the rock wall we had to negotiate again on our way down and which we wished to be off before dark and this, coupled with the fact that a thunderstorm was coming up at the time, decided us to leave Mt. Dawson for another day if the opportunity arrived. We thereby narrowly missed making the first ascent of the highest mountain in this section of the Selkirks, as we never had another good chance of ascending Mt. Dawson. Possibly Topham's barometer had something to do with it as it registered about 1,000 feet too low and made the mountain we were on appear much lower than Mt. Sir Donald, whereas we were several hundred feet higher than it.

From our camp in Glacier Circle we made several other expeditions, including one across the Deville névé as far as Grand Glacier, and then retraced our steps across the Illecillewaet névé to Glacier House. Topham had planned an attempt to ascend Mt. Sir Donald, but from the summit of Mt. Deville (Mt. Selwyn) we saw what looked suspiciously like a cairn on the top of Sir Donald and, sure enough, on our return to Glacier House, we found that Messrs. Huber and Sulzer, two Swiss gentlemen who had arrived during our absence, had succeeded in making the first ascent.

They had been so much impressed on their climb with the beauties of the Selkirk Range and the opportunities for mountain climbing that they were anxious to do some further exploration and finally we all agreed to join forces and make an expedition to the mountains beyond the Deville névé. Therefore, as soon as we could make the necessary preparations, we started from Bear

Photo, A. O. Wheeler

THE DEVILLE ICEFALL AND NÉVÉ



Photo, A. O. Wheeler

MT. PURITY

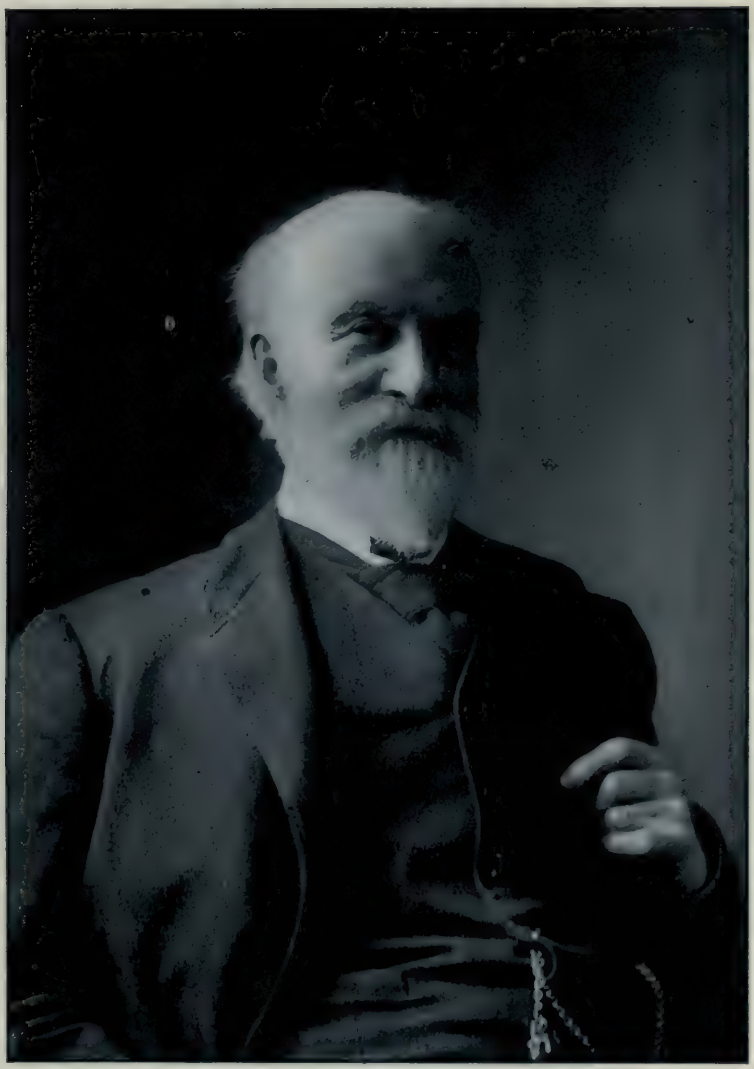
Creek station with our two guides and a pack horse, and reached a point on Prairie Mountain opposite Glacier Circle with the horse. From this point it was necessary to pack on our backs as it was impossible to take the horse down into the valley of Beaver Creek, through the thick brush and timber. We carried part of our outfit down to a camp on the banks of this creek and sent the guides back for the balance and while they were engaged in doing so Topham and Huber made a trip over the intervening rock ridge to Glacier House, returning a few days later via Glacier Circle to our camp. Sulzer unfortunately had been taken ill and had to return to Glacier House from this camp with the horse and one of our guides. The rest of us went on up the valley of Beaver Creek and made camp at the foot of Grand Glacier. From here we explored and mapped the mountains at the head of Beaver Creek and Duncan River and ascended Mt. Sugar Loaf. We then climbed up to the Deville névé, which we crossed and followed to its foot a branch glacier leading past Mt. Dawson to a point opposite the Donkin Pass. After some minor explorations from this camp we crossed the Donkin and Asulkan Passes to Glacier House again.

We found that Sulzer in the meantime was climbing the mountains above Rogers Pass, so Topham, Huber and myself made another trip over the Asulkan and Donkin Passes and proceeded to a beautiful snow-white peak which had attracted our attention on many occasions and which we had christened Mt. Purity. We climbed this peak without difficulty except for some tedious step cutting up a steep ice slope for the last 500 feet and which we found on our descent could have been avoided, and then retraced our steps to Glacier House for the last time.

It was now getting too late in the season and the weather uncertain and we reluctantly had to abandon any further expeditions.

I have often looked back to this pleasant summer spent in the wilds of the Selkirk Mountains with Mr. Topham, later with Mr. Huber as well. We had some hardships but none of them serious and Topham was an ideal companion to be with in such times, always ready to do his share and more than his share of any work, and overlook the shortcomings of a novice in the art of mountaineering like myself, and to give assistance over any serious obstacles that were beyond the ability of anyone less skillful than himself and he was besides always cheerful and good natured whatever happened.

As a mountaineer his record in the English Alpine Club will vouch for his skill and endurance. In fact if it had not been for his skill and perseverance, coupled with that of Mr. Huber, who was also a most energetic and skillful mountaineer and a good mate for Topham in every way, it would have been impossible to penetrate as far back into the Selkirk Mountains as we did at that time, when there were no trails to make the going easy and beyond a mile or two from the line of the Canadian Pacific Railway the mountains were unexplored.



SIR SANDFORD FLEMING K.C.M.G.

IN MEMORIAM

SIR SANDFORD FLEMING

Sir Sandford Fleming, Honorary President of the Alpine Club of Canada since its inception in 1906, died in Halifax on July 22nd, 1915, at the great age of eighty-eight. He had accomplished many great and important tasks in his long and honorable life and he was, as he once said, "grateful for his birth into this marvellous world and always anxious to justify it." He was born in Kirkcaldy, the "lang toon" in the Kingdom of Fife, descending from an old and worthy family of that ancient kingdom whose citizens "always hold their heads high." His maternal great-grandfather—a Cameron—fought at Culloden and was one of the loyal Highlanders who rowed Prince Charlie over to France; another of his forebears fought under Wolfe at Quebec, and a maternal uncle, his namesake, was a noted Sanskrit scholar in India.

Kirkcaldy is known to fame as the "lang toon" since "Rob Roy" when Andrew Fairservice declared "the sell o't is langer than ony toon in England." It was the birthplace of Adam Smith, the great political economist, and in its schools Carlyle and Edward Irving taught and cemented a noble friendship. It was there that young Fleming laid the foundation of his professional education, and there he received an excellent grounding in the humanities. For, it goes without saying that Kirkcaldy schools were of the best. Has it not been so throughout Scotland since John Knox? On his first visit to the land of his birth, Fleming went to see the aged Carlyle in London and was warmly received, the "weary Titan"

recalling Kirkcaldy days and Irving "the finest man he ever knew."

Fleming came to Canada in 1845 when he was eighteen years old, sailing with his elder brother David in one of the early Cunard steamers. The brothers stopped at Quebec, Montreal, Bytown (the site of Ottawa), Kingston (Queen's University then a "large, plain college"), and went on to Peterborough where they remained two months with an uncle, Dr. Hutcheson, who practised medicine there. David found employment in Toronto; Sandford began as a draughtsman in Peterborough, and in a year was surveying, making, lithographing and publishing a map of the town. Thenceforth his footing was sure. He made and published other surveys, obtained a commission as provincial land surveyor, also the Civil Engineer's certificate, and settled down to practise in Toronto.

It was now 1849 and he was twenty-two years old. In this year there began the long series of public services which ultimately made his career of such value to Canada and the Empire. On his eightieth birthday, Sir Sandford's grandchildren presented him with an illuminated address (reprinted in the first issue of this Journal), whose margin consisted of fifty-four dates or periods in his life, many of them marks of such service. Perhaps I cannot do better than take some of these outstanding dates.

In 1849 then, Sandford Fleming began to be a public man when he instigated and succeeded in getting founded the Canadian Institute which, ere he died, was authorized by King George to use the prefix Royal. In 1851 his plan of Toronto was published; in 1855 he was Chief Engineer of the Northern Railway, which eventually was absorbed by the Grand Trunk Company; in 1863, he was appointed by the Red River Settlers a commissioner to present their transportation needs to both the Canadian and Imperial Governments; the

same year he received from the Canadas, the Maritime Provinces, and the Imperial Government, a triple commission to make surveys for the Intercolonial Railway and later, was appointed its Engineer-in-Chief; from 1871 to 1880 he was Engineer-in-Chief of the Canadian Pacific Railway, during the last five years of that period being chief engineer also of the Newfoundland Railway; in 1872 he conducted an expedition across the Canadian Mountains north via the Yellowhead Pass and the Thompson River; in 1883 he made an expedition across the Rockies south to explore the proposed railway route through the Selkirks; from 1876 to 1888 he wrought with pen and tongue for Standard Time-Reckoning, which was adopted in America in 1883; from 1878 until it was laid, he was active in the promotion of the Pacific cable, making at his own expense a journey to Australia in its interests; from 1880 until the end he was Chancellor of Queen's University; in 1881 he was a delegate to the International Congress at Venice. Then, there was the "All Red Line" and "The Imperial Intelligence Service." There were other services also, but those mentioned show how close and steady a toiler was this man. In such enterprises as that of the Standard Time movement and the Pacific Cable, much opposition had to be overcome, whether of apathy or of open and secret activities; indeed, this great engineer knew well, none better, that a man wins out in great endeavours, through many obstacles. In the biography by Mr. Laurence Burpee, we get an insight into the processes by which so much was achieved in his life.

Honours came to him as the years went by, among them the LL.D. St. Andrew's University, the freedom of his native town, the C.M.G. and the K.C.M.G., the Honorary Presidency of the Alpine Club of Canada. Probably no man in Canada would have suited this honorary office of the Alpine Club so well; certainly none would have been better pleased to hold it. Sir

Sandford loved the mountains and knew the real value of mountaineering as a sport. He only regretted, as he once wrote me, that he was too old to climb them. The two expeditions mentioned are recorded in two books which members of the Alpine Club might count themselves happy to own: the journey across the Rockies north in "From Ocean to Ocean" by the late Principal Grant, and that across the Rockies and Selkirks south in "From Old to New Westminster" by Sir Sandford himself. Both are fascinating narratives of mountain adventure and will never lose their interest and historic value.

Dr. Grant accompanied Mr. Fleming on both expeditions though the second one was much less imposing. In "From Old to New Westminster" there is a description of a charming episode on Rogers Pass, an episode recalled in the article, "Memoirs of the Mountains" which Sir Sandford contributed to the first issue of this Journal. Waiting on the summit of the pass while the weary, hungry horses fed on its rich pastures, every man of his company felt the impression of the place. Many members of the Alpine Club know how impressive are the views you get from that lovely meadow, lift your eyes in what direction you may. The mountains round about inspired and challenged them, and it was proposed to organize a Canadian Alpine Club on the spot, so to preserve a memorial of their visit. Says Sir Sandford: "The writer as a grandfather is appointed interim president, Dr. Grant, secretary, and my son, S. Hall Fleming, treasurer. A meeting was held and we turn to one of the springs rippling down to the Illecillewaet and drink success to the organization. Unanimously we carry resolutions of acknowledgment to Major Rogers, discoverer of the pass and to his nephew for assisting him." And the happy party proposed as the Club's first mountaineering venture, the conquest of Mt. Sir Donald, then named Syndicate Peak. Major Rogers, who met them on the pass, declared it as

the height of his ambition to erect the Union Jack on its summit, the day when the first train passed through the Selkirk Range. Two years later, Sir Sandford was on that first transcontinental train and the American major, so keen about the Union Jack, was waiting at Craigellachie, seventy-five miles west, where he was to hold the ends of the ties linking the railway east and west while Lord Strathcona (then Sir Donald Smith) drove the last spike in the Canadian Pacific Railway. Standing next to Sir Donald while he performed the ceremony were Sir Sandford and Sir William Van Horne. The spike driven home, for a few moments the spell of silence was upon the throng gathered there in the mountains, and then "the pent up feelings found vent in a spontaneous cheer the echoes of which will long be remembered in association with Craigellachie." So wrote Sir Sandford, and I am very sure that the two eminent Scotsmen recalled the war cry of the Clan Grant to which the older man belonged—"Stand fast, Craig-ellachie!"

Sir Sandford's last public work was in connection with the Memorial Tower in Halifax, erected to commemorate the 150th anniversary of Colonial self-government. He gave to the City the beautiful site at the Northwest Arm on which the tower was built and a large tract of land adjoining for a park. Here had been for many years his beautiful country place named "the Dingle." For the most part his closing years were quietly spent at Winterholme, his Ottawa residence. Never idle, he retained to the last all his keen interest in the larger movements of life, and to the end he remained a forward-looking man. The very clasp of his hand did one good. His life is an example and an inspiration to our Canadian youth. I cannot help quoting his own words, which are taken from his biography:

"I have always felt that the humblest among us has it in his power to do something for his country by doing his duty, and that there is no better inheritance to leave

his children than the knowledge that he has done so to the utmost of his ability. It has been my good fortune to have had my lot cast in this goodly land, and to have been associated with its educational and material prosperity. . . . . I am profoundly thankful for length of days, for active, happy years, for friendships formed and especially for the memory of those dear souls who have enriched my own life while they remained on this side."

And this good man, being dead, yet speaketh.

ELIZABETH PARKER.

MAJOR STANLEY L. JONES, P.P.C.L.I.

War takes its toll of the bravest and best. Among our members few were so well known as Major Stanley L. Jones. We had elected him President of the Club for the ensuing term, the highest honour we could bestow; and now he has gone from us, gone from us giving in generous fashion as was his wont, the best he had to give—his life—for freedom and for the Empire of which he was such a devoted son.

He was born at Wolfville, N.S., in 1878 and was educated at Acadia University. He taught school for a time in Manitoba, but was always a soldier at heart, and at the outbreak of the Boer war went to South Africa with the Nova Scotia company in the first contingent. He fought at Paardeburg and was in the squad to which Cronje surrendered. When peace reigned again he returned to Calgary where he studied law and later formed a partnership with W. F. W. Lent, the firm soon becoming well known in the legal world of the West. Some years ago he was made K.C. His investments were successful, his home happy and all seemed of fair promise.

He was a keen traveller, he had seen much of Europe, as well as of the North American continent, and wandered widely through the Balkan states during the former war.

His love of mountaineering was deep. As soon as the

LATE MAJOR STANLEY L. JONES, P.P.C.L.I.

Alpine Club of Canada was formed he joined, becoming an active member at its first camp at Summit Lake in 1906, and ever preserved his enthusiasm for the work it was doing for Canada. He was never too busy to give his advice when needed. To his generous gift the Club is indebted for the fine dining room at the Banff Club House which he admired so much.

Immediately the great war was declared, he telegraphed to Ottawa offering his services and was given a commission in the famous Princess Patricia regiment. He was soon promoted Captain and died a Major. Shortly after arriving at the front he was wounded in the hand. Recovering, he returned and was after some time wounded by shrapnel in the foot. Again he returned to the front and was wounded on June 2nd by an aerial torpedo and taken prisoner. The Germans gave him every possible attention, but he died in hospital and was buried in the convent garden at Moorslede, near Ghent, with military honours. The Belgian soil should rest lightly on him.

He was much interested in politics, and while at the front was asked to permit his name to be submitted as a candidate for parliamentary honours. He absolutely refused, realising as all the first contingent have done, and as those at home are at last beginning to realise, that the war, the fight for the right, is the only thing that matters. All else is triviality.

A gallant soldier, he died as he lived, a gentleman. There is no higher praise.

His wife, herself a soldier's daughter, has been serving through the war with the French Red Cross, and for her valued services has been granted the rank of Lieutenant. To her the Club extends its sympathy in fullest measure.

S. H. MITCHELL.

J. J. ROBINSON, D.D.

Every member of the Alpine Club of Canada who knew him or knew about him will realize how great a

loss has befallen us in the death of the Very Rev. Dean Robinson, Warden of St. John's College, who passed away on the morning of June 14th, at St. John's, Winnipeg. Though not holding the office of Dean since he left Belfast for Canada in 1911, he was called "the Dean" both in the Club and throughout the Western country. Therefore in this little memorial sketch I shall use the more familiar title.

Last November, Dean Robinson had a severe attack of angina pectoris and, though he continued to perform his manifold duties in and out of the College throughout the long and extremely severe winter, his strength steadily failed until he was stricken with the last sudden illness.

John Joseph Robinson was born in Dublin on January 16th, 1852, and was, therefore, only sixty-four years old. He was the son of John Robinson, proprietor of the Daily Express newspaper, and was educated at Blackheath School and at Trinity College, Dublin, where he won the gold medal for Literature and History. His first curacy was in the East End of London, and there he labored until his health broke down and the doctor ordered a long holiday, which was spent in Egypt and Palestine. Returning to England, he accepted a curacy with an uncle at St. Leonard's, Sussex, from thence going to St. John's, Holborn, London. Here he married Hariet, daughter of Sir John Lubbock, third baronet, and sister of the first Lord Avebury, whose name is familiar among reading families everywhere. The wedding took place on June 18th, 1878, and six months later, owing to a desire to be near his mother during his father's illness, Mr. Robinson accepted a curacy in St. Matthias, Dublin. Henceforth until coming to Canada his work lay in Ireland.

It was his last curacy. In 1884, he was appointed rector of Killiskey, a beautiful little parish in County

Wicklow, and from there he was transferred to more important parishes, going in 1900 to the Cathedral parish of Waterford, where he performed the duties of both dean and rector, his predecessor, who was in ill health, still holding the title of Dean. Three years later he became rector of St. Anne's, Belfast, and Dean of the Cathedral; and in Belfast he spent eight strenuous and fruitful years. The cathedral was in course of building and when the nave was opened for service, which is all that has been built to this day, there was a congregation of some thirty souls only. But the Dean soon changed all that. In a short time the morning and afternoon choral services were attended regularly by five and six hundred, and the evening mission service by a thousand and more. The Dean nearly always preached at this evening service, which was attended chiefly by the poorer classes; and his custom was to wait at the door until time for service to begin that he might shake hands and say a kind work to the people as they came. Besides this service, he held a special mission every Thursday evening for the very poor of the slums, to which came men and women with babies in their arms and shawls on their heads. During the eight years of his incumbency at Belfast, Dean Robinson baptised about fifty babies every week. He never missed the eight o'clock Celebration, though it involved walking a mile. No man had a greater capacity for duty nor a greater love for the ministry of the Gospel. He was essentially a dispenser of spiritual things. The task of collecting money he disliked extremely, but this also was duty and he faced it with courage and with success. When he came to Belfast he found large debts; when he left, every indebtedness was paid, and the building as it stood was free of that burden. Also, for his sake, legacies have been left to the cathedral.

Responding to the call from the far Northwest, Dean Robinson came out to Edmonton five years ago and

threw his abundant energies into mission work; and speedily it was known that a fresh spiritual and intellectual force had come to the new country. And so it has been at St. John's College, Winnipeg, where he taught in both the Arts and Theological departments and where he preached in the College chapel and fulfilled various labours of love. Beyond the College and Cathedral of St. John's he was greatly in demand for other pulpits and platforms. There is no doubt that he wore himself out too early. In all his heavy labours in the Old World, and in the New, he had an ardent and wise and noble helpmeet in his wife, to whom our sympathy goes out in her great loneliness. After such long and faithful and loving service together, how good it would have been to grow old sharing in the rich quiet of its afterglow. The Dean knew his Browning thoroughly and Rabbi Ben Ezra's incomparable picture of old age and its contemplations must sometimes have been in his thoughts; also, that prospective retrospect, "By the Fireside," and its searchingly beautiful Alpine pictures with which his many holidays in the Swiss Alps made him familiar.

Although the years of active service in the Church had worn him down, when the war broke out the Dean offered himself as a chaplain for the front. He was disappointed in that, but he had satisfaction in his four sons who are serving the King, two in Flanders, one in England being incapacitated for foreign service, and the eldest, a clergyman, in a volunteer corps in Dublin. One son has received the Military Cross. He leaves two daughters; one is the wife of a naval commander, and the other is the wife of an officer in France.

Dean Robinson was an ardent and enthusiastic mountaineer of long experience, and he was a capital sailor. The great mountains and the lifting sea were both dear to him, but I think that he must have loved the mountains more. In youth, he and his brother owned a

little yacht in which they used to sail about in Dublin Bay and on the coast of Scotland. Always, he had been a keen sportsman—at Trinity College, captain of the football team. He joined the Alpine Club of Canada in 1912, and attended the Camp at Vermillion Pass, where he won all hearts. The camp was some distance from the "graduating" mountains and there was much bad weather. One very dismal day when the mental barometer of the camp fell low, the Dean improvised jolly entertainments and told amusing tales until the members were in happy mood. At campfire he had many interesting climbing experiences to relate, those experiences in other mountain systems which our members are always so ready to hear. With Mrs. Robinson and their son, the Dean was at the Camp of 1914 in the Little Yoho Valley. Mrs. Robinson was the chaperon of the camp and was as popular as he, taking charge of the choruses and other performances at campfire. They went on many expeditions and took great pleasure in the life of the camp. At both the Vermillion and Little Yoho Camps the Dean conducted the Sunday services, and no one who heard his mountain sermons will forget them. And so it was when he spoke at the annual dinners of the Winnipeg section, of which he was honorary chairman. He spoke with such charm and he had such humour; and always the climax of his speech touched the finer things of the spirit. I remember how he quoted, and praised Mr. Lloyd George for it in quoting, that now familiar passage about the great peaks of honour and duty and patriotism, and the white pinnacle of sacrifice pointing to heaven. He seemed to put fresh vitality into the passage. But his own expression was always literary and spontaneous. It had the real touch of poetry. For, was he not a well-learned Irish gentleman and therefore a poet, receptive if not creative? As a mountaineer, he carried deep in his heart the lessons of beauty and truth which the mountains teach and he taught less responsive climbers how to learn these

lessons. He understood the far-reaching and many sided influence of a national alpine club to Canada. Though he knew that he would never again hear "the music of whistling stones and cracking ice" on a high mountain side, he had expected to "take the road" to the Rockies this summer, where in lovely valleys between snowy ranges, both soul and body would find refreshment . . . And now his body rests under the oaks in the old cemetery by St. John's Cathedral. His rare and gallant spirit has climbed the last white pinnacle and "aspired the clouds." In an aesthetic and spiritual sense, he was the finest influence that ever came to the Alpine Club of Canada.

ELIZABETH PARKER.

J. B. McLAREN

We regret to have to record the death of Mr. J. B. McLaren, of Winnipeg, which occurred in Victoria this spring whither he had come to seek a milder climate.

He was born in 1855 at Carleton Place, Ontario, and graduated at Queen's University in 1878. He practised law in Ontario and in Manitoba, and in 1908 became manager of the Canada Landed and National Investment Co., in the latter province.

In 1908 he joined the Alpine Club of Canada, and in 1909 attended the Annual Camp at Lake O'Hara. There he, with Mrs. McLaren, graduated to Active Membership on Mt. Huber. He paid several other visits to the Club House at Banff, of whose beauties he had a keen appreciation.

He had an intense love for the mountains, the woods and the waters, and spent many summers camping and canoeing, welcoming many guests but always insisting that he should monopolise the work and they should rest and enjoy.

We extend our sympathy to Mrs. McLaren, who shared her husband's love of Nature and whom we hope to see among the mountains for many years.

ALPINE CLUB NOTES

The Scouts

Every member who has been at the annual camps will remember the boys who have acted as scouts and helped the newcomers in many ways. They also are doing their share at the front. Many will recall John Bone who was at the Paradise Valley Camp and many succeeding ones. After a distinguished career at McGill University he went to the front as a member of the Flying Corps. One night volunteers were called for to undertake some especially dangerous duty. Among those who answered the call was John Bone. He never returned. Something happened to his machine; he was drowned and his body washed ashore. He sleeps in Belgian earth, for which he fought so well.

W. Jewitt is in the trenches with the Princess Patricias; Linton is in England, training; John Colville is with the University Battalion; and Gordon Cameron has recently enlisted with the Artillery. Dalton McWilliams enlisted in the University Battalion, but death took him ere his day; before he had chance to fight for his country or develop the gifts which he so markedly possessed.

Crowsnest Mountain and Mt. Windsor

Mr. Godsal sends an interesting account of his ascent of Crowsnest mountain last summer by a "back stairway" in distinction to the ordinary route or "grand staircase." His exploratory trip to the north side of the mountain was hard, as all necessaries had to be carried through miles of forest. The next day, August 7th, after following the base of the precipices which encircle the upper part of the mountain, he found a narrow "shute" on the north side near where a rocky ridge runs out, by which he got above the precipices, the rest of the way to the summit being fairly easy. The climb was rather spoiled by the quantity of loose stones on the steep slopes. He found an easy way home by a trapper's trail. The start for the mountain can be made from Coleman or from Sentinel siding, C.P.R. About 4½ miles from the latter and 7 miles from Coleman is a lumber camp. Here a careful search must be made for the trapper's trail, leading through the forest to the north side of the mountain. It is fit for a horse and a grassy spot can be found near where the ascent begins. Crowsnest Mountain is 9,138 feet, and the lumber camp 4,700 feet. The records on the summit show the names of Edward Whymper, Tom Wilson and two Swiss guides, on June 28th, 1904; P. D. McTavish, Alex. Gordon, Laura Marshall, Helen Hatch, F. O. Hyde, Gilbert Marshall, on August 20th, 1907; Robertson, Phillips, Norris, August 21st, 1908. P. D. McTavish left no record of the climb described in the Journal for 1907.

On August 31st, Mr. Godsal again ascended Windsor Mt. (formerly Castle or Turret) by a new route from the west from the valley of Castle River, and visited both the southeast and northwest peaks. The turret on the latter is a remarkable rock formation perched on the edge of great precipices on its three sides. The ascent was not difficult and horses can be taken up the valley to where the ascent begins. The highest peak is 8,360 feet. The river swarms with fish and game of all kinds, including elk, which are abundant.

REVIEWS

Travels in Alaska—By John Muir*

Alaska Days with John Muir—By S. H. Young**

In these volumes of Alaskan travel and biography we are brought into close acquaintance with that great lover and interpreter of nature and of the mountains, John Muir. After a decade of flower, tree and glacier study among the Sierra Nevada mountains of California, Muir visited the glacier-hung Cascades, and then sailed northward to explore the vast ice-fields of Alaska.

Muir's first trip, in 1879, was in company with the religious advisers of Mr. Young who had recently entered the field as missionary to the Indians of southeastern Alaska. The party established headquarters at Fort Wrangel, from which they made frequent trips to the Indian villages of the surrounding region. They chartered a little steamer and explored the canyons of the Stickeen, finding very wild and beautiful scenery with which Muir and Young determined to become more closely acquainted. Leaving the steamer of an afternoon, Muir set a rapid pace through ten miles of Alaskan jungle until they came to the slopes of an 8,000-ft. mountain, from whose summit they intended to view the sunset. Here they revelled in the Alpine flower gardens, gathering specimens, while Muir talked to the flowers as personally as if he belonged to their own family.

They crossed a small glacier and climbed a rather difficult cliff where they paused for a glorious view of the valley of the Stickeen. Realizing that they must hurry to reach the summit, Muir fairly slid up the mountain, while Young did his best to keep up. Trusting his foot to an uncertain rock, Young suddenly found himself with both shoulders dislocated, sliding rapidly down a gully that ended in a thousand-foot precipice. He was unable to stop until he actually overhung the edge. Muir could not reach his friend at first, but, whistling to impart courage, he ascended to a point where he crossed the gully and then descended to a tiny ledge from which he grasped Young's collar. Holding to the cliff with one hand, with the other Muir swung this helpless man out over its face, and, pulling him in, grasped his collar with his teeth. Then, bidding him work his feet, this man of iron climbed the dozen feet of cliff to safety. Few would have attempted to return that night, but Muir did not hesitate. Down, over the glacier and through miles of unknown canyon, Muir carried his friend, reaching the steamer in the morning. After spending several hours in helping to get Young's shoulders in place, Muir led the others of the party on a glacier exploring expedition, returning in the evening as "fresh and enthusiastic as ever."

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* Boston: Houghton Mifflin, 1915, $2.50 net.
** New York: Revell, 1915, $1.00 net.

With this introduction a life-long friendship was insured. Muir explored the country and traversed the glaciers alone, returning with glowing accounts for his friend. Together they sailed northward in a canoe, guided only by Vancouver's early chart, mapping the coast as they went, and exploring its many fiords. They took the first census of the Indian villages, and had many interesting experiences among the natives. "Muir was a devout theist. . . . He saw design in many things which the ordinary naturalist overlooks, such as the symmetry of an island, the balancing branches of a tree, the harmony of colors in a group of flowers, the completion of a fully rounded landscape." Muir saw God working in the heart of Nature, while Young found Him in the heart of his friend.

Glacier Bay was visited and the great glacier that was later to bear Muir's name was explored by him. On the return voyage the Davidson and Taku glaciers were seen. To one who is familiar only with inland glaciers, the great rivers of ice which tumble into the sea along the Alaskan coast are a revelation. Who can paint the opalescent hues of their sea-washed cliffs, or the intense coloring of their floating castles of ice?

The following year Muir returned to Alaska and with Young set sail in an Indian canoe in search of the unknown. They entered Sum Dum Bay finding wonderful scenery, and followed up a narrow fiord that led them past precipitous walls rising for thousands of feet, whose tiny ledges are hung with ferns and flowers, and whose summits are glacier-crowned. Finally a glorious sea-filled valley opened before them which they appropriately named Yosemite Bay. Down its mighty cliffs tumble snowy waterfalls, while at its upper end a deep-toned glacier hurls its bergs into the peaceful waters of the bay. We believe that eventually this fiord will be sought and recognized as one of unique grandeur.

The climax of the trip was reached at the Taylor Bay Glacier, which Muir started out to explore alone on a wild, stormy morning. He was joined by his inseparable companion, Mr. Young's little dog, Stickeen. Together they ate a crust of bread that was to be their only food for seventeen hours of unremitting toil, and then climbed upward upon the deeply crevassed surface of the glacier. Here they worked their way for seven miles amid the fog and rain until they reached the far side of the glacier. It was five o'clock when they started back across the glacier, and a driving snowstorm hid all from view. Losing their way among the crevasses they often had to work up and down for miles in order to find a bridge over which they might advance a few feet. Difficulties seemed only to increase Muir's power to overcome them, and he pushed on at top speed. Finally they reached a chasm eight feet in width which had to be crossed in order to advance. Its farther side was the lower one, thus preventing return; but, taking the risk, they leaped and found themselves upon an island of ice two miles in length. Their only hope of escape was along a knife-edge sliver of ice that stretched like a cable for seventy-five feet across the bottomless crevasse. To reach it Muir had to cut his way down the vertical ice for eight or ten feet, then astride he worked his way by inches, fighting the furious gale in the darkness as he leveled a narrow pathway along the arête for Stickeen to follow. He finally arrived at a wall of ice up which he cut hand and foot holds to safety. Reaching camp at

ten o'clock he recounted his adventures for a couple of hours, and, the next morning, got up at daylight and was off with Stickeen on an all-day climb of a high mountain!

In 1890 Muir undertook a serious exploration of the glacier bearing his name. Alone he dragged a hundred-pound sled far up its rough and dangerous surface. With no complaint of hardship he rejoiced in the radiance of the snow crystals melting in the sun, but, gazing too continuously without protection, he nearly became snow-blind. Returning to the bay, he left in his canoe in search of other glaciers. Attempting to pass an icy barrier, he entered a passage-way four feet wide and two hundred feet long. When well within their grasp, he discovered the ice walls were closing upon him, and he had barely time to retreat before they came together with a growling crunch.

Muir's descriptions of the unsullied whiteness of the great Fair-weather Range, of the alpen-glow that flames on virgin peaks and of the fountains of radiant spray that shoot upward at the birth of ice bergs, are of supreme beauty. He pictures a phosphorescent sea that on darkest nights sends "luminous wave foam dashing against every bluff and drifting berg"; and he tells us of the unpaintable arctic aurora beneath whose wonder and mystery he passed long, worshipful nights.

In beauty of style John Muir is unsurpassed among the interpreters of nature, while his intimate acquaintance and sympathy with flower, tree and mountain enable him to reveal their messages to us in a language which all may understand. We listen as it were to their own voices, and with Muir give thanks to God. Many who have known Muir in person or through his writings, can say with Dr. Young: "The world has produced but one John Muir, and to no other man do I feel that I owe so much; for I was blind and he made me see!"

LeRoy Jeffers.

The Mountain—By John C. Van Dyke*

The title of this book may convey a wrong impression to any one who takes it up by chance—the most delightful way of discovering a book. "The Mountain" is not any definite peak; it refers to the whole mountain entity. The book is composed of a series of essays or reflections upon the mountain world from the aesthetic point of view, which perceives beauty everywhere. In this it somewhat resembles "The Alps" by Sir Martin Conway, though, being written for the American public, it contains more direct instruction.

Professor Van Dyke impresses the important fact upon his readers that it is impossible to compare with advantage one mountain range with another; each has its own particular glory. It is unfortunate that his first view of the Rockies should have been apparently from too far south to appreciate that wonderful effect with which all who have approached them from the Canadian plains are so familiar—the appearance of a huge rocky wall, tipped with

* Charles Scribner & Sons, 1916, $1.25 net.

snow, a barrier beyond which man should not pass—the end of the world.

He notes the desolation of the western mountains. The Indians always feared them, believing, with a more ancient people, that the Great Spirit is a God of the Hills. They do not hunt, they do not name the peaks. The Indian names have been mostly given by the white man.

Professor Van Dyke contends that the drawing of the hills is their most commanding feature. This is true—at first. But, apart from the glory of the heather-clad hills, that blaze of purple, and the velvety greens of forest and of alpine meadow, the mountain tops have also, more especially perhaps in European countries, their kingly state, whether they be pyramids of rock or reveal the secrets of the snow. Any one who has been able to watch a mountain chain day in and day out under the lights and shadows of the passing clouds, realizes their abiding charm is that of light and shade, a blaze of rose, or the soft harmonies of grey and purple which linger in the memory.

It is interesting to note the author's explanation of the blazing whiteness of the upper snows, "brighter than the sky at noon day." "It is the sun face that we are seeing in the snow, the shadowed back that we are seeing in the sky." At such heights the shadows are but another form of light, the blue shadows of the glaciers have a vivid intensity of their own.

The high mountains wear Gargantua's colours. "White doth signify gladness, pleasure, delight and rejoicing; and the blue, celestial things."

The book is light to hold, well printed, and a charming companion for the fireside when one's holiday is past and one dwells with happy recollections.

S. H. Mitchell.

On Alpine Heights and British Crags—By George D. Abraham*

In old fashioned cookery books, such as "Meg Dods" which amused Sir Walter Scott, a recipe for a dish is often followed by "Another Way." To those many readers who are familiar with Mr. Abraham's books his new work may be thus described. The plan is familiar. There are the stories of climbs in continental Europe as it was before the war, the chapters of sound advice to beginners and the accounts of climbs in his heart's home, the rocks of the British Isles.

The present writer is, unfortunately for himself, unable to follow any of the author's climbs in detail. He never was in the Dolomites nor has climbed (really climbed) in the English hills. In the gallery of his life one of the most beautiful pictures is a view from Friar's Crag across Derwentwater up Borrowdale to "far Glaramara," when all was steeped in moonlight and faint mists were rising from the lake.

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* Houghton Mifflin Co., 1916, $2.50.

The book, naturally is written from the inside, for people who know and for the ordinary reader the accounts of the climbs are somewhat monotonous, suggestive of a constant diet on pemmican. It is not given to many to write with the inspiration of Leslie Stephen or Guido Rey, to whose books one returns with ever fresh interest.

Mr. Abraham's new book suggests that he is growing out of the heresy that climbing is the whole art of mountaineering. We wish he could have some experience in the Rockies or—at a more suitable season—in the Caucasus. He would find, as the trained guides find, the charms and real difficulties of pathfinding in an untravelled country and on an unknown peak. There is always a right way, not necessarily the easiest, up a mountain. It takes a real mountaineer to find it.

Ice and snow have their charms and their especial difficulties not obvious to the tyro which take much experience and—though this is heresy to the rock climber—brain power to master.

As usual Mr. Abraham's advice to less experienced climbers is invaluable. He insists on the golden rule that the only good climbing is safe climbing, the rule which has made the British climber, whose record for skilled and difficult mountaineering is second to none, while not of course immune to accident, the most fortunate of the people who climb. In roping on rocks he advises the most skilful man should lead, the strongest and steadiest should be *second* on the rope, that he may be able to belay and hold either of the others. He continues: "Those who have learnt *all* about rock-climbing at home in summer and winter should manage safe guideless climbing in the High Alps *after two seasons with first class guides.*" (The italics are ours.)

There are, he states rightly, two unavoidable risks: sudden weather changes for the worse and falling stones. There is one risk which he sternly and justly forbids any man to take, that of climbing alone. It has undoubted attractions, but if it is wrong on the much frequented European mountains, it is doubly criminal in the lonely mountain regions of the west.

The book is illustrated with many of the characteristic Abraham photographs which are always a joy. Perhaps the most original illustrates the ascent of the Mönch in a storm. The print is large and clear and the book is eminently readable.

S. H. Mitchell.

OFFICIAL SECTION

REPORT OF PTARMIGAN LAKE CAMP

The tenth annual camp of the Club was held in Ptarmigan Lake Valley, about half a mile below the pass, from July 13th to 26th, 1915. It was pitched in the little valley of Phacelia Lake, below Mt. Richardson, running into that of Corral Creek, and was not visible until it was almost reached. The first sail in sight was the lofty canvas of the dining tent. Owing to the conditions of the site, it was pitched narrower and much higher than usual. The effect was not ornamental, but, as after events showed, the lofty ceiling was inspired by a wise if unconscious foresight. When the winds blew and the snow came members were able to build a large fire with safety inside the pavilion and enjoy all the comforts of a home.

The site of the camp was a beautiful one, affording magnificent views of the mountains of the Bow Valley. On the first evening the camp fire was lit on a projecting point backed by tall trees commanding this view in full splendour. Only those who know the mountains well can appreciate the glory of form and coloring. In the words of a master of English, written of a widely different scene: "After you have once seen it the remembrance remains with you like a tune from Mozart, which he seems to have caught out of heaven and which rings sweet harmony in your ears for ever after! It's a benefit for all after life! You have but to shut your eyes and think and the delightful vision comes smiling back."

It was never to be quite the same again. The next day the weather changed, and the Club "enjoyed" the worst experience of the kind it ever suffered in camp. Heavy falls of wet snow rendered climbing too dangerous to be attempted and camp conditions by no means of the pleasantest. However, every one present made the best of things and, when the fine weather came later, appreciated it all the more.

A subsidiary camp was placed at Hatchet Lake near the divide, between the headwaters of the Red Deer River and Little Pipestone Creek, a delightful neighborhood, quite unknown, and very convenient for the ascent of either the White or Black Douglas.

A distinguishing feature of the Camp was the Patriotic night held around the Camp Fire on the evening of July 17th. Some eighty members of the Club are under arms for their country; their names were recalled and an enthusiastic standing vote of appreciation of their patriotism was passed. Account also was given of the motor ambulance which the generosity of the Club has provided for wounded soldiers.

W. N. Rowell, leader of the opposition in the Ontario legislature, made a stirring address dealing at first with the work on the Gallipoli peninsula and ending with an impassioned appeal to all to help the

Photo, A. B. Dawson

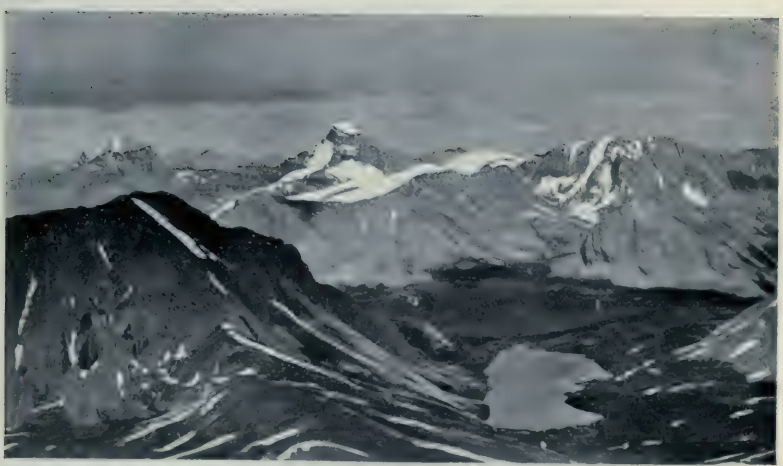
PTARMIGAN VALLEY CAMP

Photo, A. B. Dawson

CAMP AT HATCHET LAKE
Red Deer Valley

Photo, F. W. Freeborn

PTARMIGAN LAKE AND MT. REDOUBT



Photo, F. W. Freeborn

VALLEY OF BAKER LAKE

Black Douglas and White Douglas on Left

cause of right by every means in their power. American members expressed their keen sympathy with the Allies, and a number of other most interesting and instructive addresses, dealing with war matters, were given. The meeting closed with an impressive singing of the National Anthem, to which the mountains around joined their echoes.

During the camp word was received of the death of Sir Sandford Fleming who had been its Honorary President from the first organization in 1906, and the flags were lowered to half-mast.

Owing to war conditions the attendance was much smaller than usual, 103 being placed under canvas. They were drawn from the following places:

CANADA

British Columbia: Invermere, Revelstoke, Vancouver, Vernon, Wilmer.
Alberta: Banff, Calgary, Cowley, Edmonton, Green Court, Iron Springs, Lethbridge, Macleod, Sarcee Camp, Tomahawk, Westlock.
Manitoba: Virden, Winnipeg.
Ontario: Ottawa, Toronto.

UNITED STATES

Indiana: Lafayette.
Maryland: Baltimore.
Massachusetts: Boston.
Minnesota: Minneapolis.
New Jersey: Summit.
New York: Brooklyn, New York.
Virginia: Pittsburg, Alexandria.

OVERSEAS

England: Darwen.
Switzerland: Interlaken.

There were present members of the English, Swiss, American and New Zealand Alpine Clubs, of the Appalachian Mountain Club, of the Mazamas and of the Royal Geographical Society.

THE ANNUAL MEETING

In accordance with the Constitution, the Annual Meeting was held at the camp fire circle on July 22nd, 1915. In the absence of the President and the Vice-Presidents the Director took the chair.

An address of greeting from the President was read, regretting his unavoidable absence, and calling attention to the good work the Club was doing not only among its own large membership, but among people at large in spreading the knowledge of the Canadian mountain region.

Communications were then read from Hon. Mr. Justice Galt, Lieut. Norris Irven (who was wounded at the front), Mr. Hayter Reed and Miss M. L. Jobe.

The Director submitted his report, giving the history of the Club for the last year and awakening new enthusiasm among the members for the serious work of the Club.

A letter from the Hon. Treasurer was read, stating the financial

condition of the Club and impressing the necessity of prompt payment of fees that the Club in its turn might carry out its obligations.

The Secretary-Treasurer's report was read giving details of the Club's membership and urging the younger members to take up their share of the burden of the work.

Mr. N. W. Rowell then moved, in an eloquent speech, that a resolution be sent to the members gone or going on active service, conveying the Club's appreciation of the splendid way they had responded to the call of the Empire, at the same time bringing honour to the Club. The motion was seconded by Mr. Voss and carried.

The resolution was later sent and many acknowledgments received expressing great gratification and enthusiasm for the Club.

Votes of thanks were passed to the Governments of the Dominion and of Alberta for their steady financial support of the Club and appreciation of the work it was doing for the country at large.

Votes of thanks were also passed to the different authorities of the C.P.R., whose aid contributed largely to the success of the Camp.

A vote of thanks was passed to Mr. W. J. S. Walker for his continued kindness in supplying the medicine chest which he had so generously given.

A vote of thanks was passed to the Director, the Secretary-Treasurer and those under them in appreciation of their untiring work in making the camps a success and a delight. The name of Mr. C. H. Richardson was specially mentioned.

The meeting then adjourned.

REPORT ON MOUNTAINEERING AND EXPEDITIONS

Among the principal ascents made were: Black Douglas (11,015 feet), Mt. Richardson (10,115 feet), Ptarmigan Peak (10,060 feet), Pika Peak (10,015 feet), and Mt. Redoubt (9,510 feet). Two ascents of the Black Douglas were made; the climb of the White Douglas was rendered impossible by the dangerous condition of the snow. Pika Peak afforded a really fine rock climb.

There were very many attractive expeditions threading the various valleys. One of the charms of the region is the number of lakes it contains. From the summit of Ptarmigan Peak sixteen were counted of varying size.

The professional guides were Ernest Feuz and Christian Jorimann, lent by the C.P.R., and Conrad Kain whom Mr. Frind kindly spared on several occasions.

Twenty-three graduated to active membership. Their names are given below:

Mt. Richardson, July 18

A. L. Harkness
A. W. MacMichael
C. E. W. Stringer
G. D. Whitaker

Mt. Ptarmigan, July 19

Mrs. G. E. Vincent
J. H. Vincent
H. S. Hall

Photo, A. B. Dawson
WALL AT END OF LAKE MYOSOTIS

Photo, L. C. Wilson
SUMMIT OF PIKA PEAK

Photo, A. B. Dawson
A JOLLY GLISSADE

Photo, G. W. Patterson CAMP DURING THE SNOW STORM

Photo, F. O' N. Fisher
BAGGAGE ARRIVING AT HATCHET LAKE CAMP

Photo, G. W. Patterson
HATCHET LAKE AND THE BLACK DOUGLAS

Mt. Richardson, July 19
Miss H. D. Banks
Miss M. C. Jamieson
Miss H. Moyle
Miss M. Macoun
Miss M. L. Maclean
Miss B. McKinley
Miss P. I. Rupp
W. E. Broad
J. L. Fawcett
C. W. Noble
P. Van Eyk

Mt. Ptarmigan, July 20
Miss C. R. Filer

Mt. Richardson, July 20
G. H. Theiss

Mt. Richardson, July 22
Miss M. C. Rowell

Mt. Richardson, July 23
Miss C. Christie

Mt. Ptarmigan, July 25
Dr. D. A. Taylor

THE CLUB LIBRARY

There have been several additions to the Club Library during the past year. Noticeable is Miss Finlayson's gift of two of the parts, beautifully bound together, of Captain Palliser's Reports of his explorations between the Red River and the Pacific. It is very seldom any parts of this exceedingly rare book are to be found. The Minister of the Interior has presented the Atlas of Canada, containing statistics of the utmost value. The Government of New Zealand has most generously given us "The Conquest of Mt. Cook," by Miss Du Faur, and Mr. Gooding's popularly written "Picturesque New Zealand."

We have received the usual exchanges with the exception of "La Montagne," the journal of the French Alpine Club, and the Journal of the Tourist Society of Dauphiny. Life is too strenuous in France now. Naturally also we have not received the Journal of the German-Austrian Club.

Among books we should like to possess are:

Index and Maps to Capt. Palliser's Reports, pub. 1865.
Journals of Capt. Palliser (including Sir James Hector's diary), pub. 1863.
Twenty Years in the Himalaya. C. G. Bruce.
Explorations of the Caucasus. D. W. Freshfield.
Building of the Alps. T. G. Bonney.
Mountains: Their Origin, Growth and Decay. Jas. Geikie.
The Alps. Sir M. Conway.
Complete Mountaineer. G. D. Abraham.

The list of additions follows:

	Donor
Atlas of Canada - - - - - -	Minister of the Interior
Conquest of Mt. Cook. F. Du Faur	New Zealand Government
Forty Years in Canada. S. B. Steele	A. O. Brigden
Karakoram and Western Himalaya. F. de Filippi - - - - - -	LeRoy Jeffers
The Mountain. J. C. Van Dyke - -	Chas. Scribner & Sons
On Alpine Heights and British Crags. G. D. Abraham - - - - - -	A. O. Wheeler
Our American Wonderland. G. W. James	LeRoy Jeffers

Alaskan Glacier Studies. Tarr and Martin - - - - - - - - - -	National Geographic Society
Reports on Explorations between Red River and Pacific. John Palliser, 1859 and 1860 - - - - - - - - - -	Miss A. Finlayson
Peaks and Precipices. Guido Rey - -	Miss J. L. McCulloch
Picturesque New Zealand. P. Gooding	New Zealand Government
A Search for the Apex of America. Annie S. Peck - - - - - - - -	W. E. Stone

SIR EDMUND WALKER, C.V.O., LL.D., D.C.L.
Honorary President, Alpine Club of Canada

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Copies of the current and past issues of the Canadian Alpine Journal can be obtained from the Secretary-Treasurer, S. H. Mitchell, Sidney, Vancouver Island, B.C., from whom also the prices of the back numbers can be obtained.

All applications for copies must be accompanied by money order or postal note. Cheques not accepted.

By furnishing the address you can have copies sent to friends.

LIEUT-COL. C. H. MITCHELL, C.M.G., D.S.O.
Officer's Cross, Legion of Honour
Order of Leopold
Vice-President A.C.C.

LIEUT.-COL. R. P. CLARK, M.C.

CANADIAN ALPINE JOURNAL

PUBLISHED BY
VOL. VIII. THE ALPINE CLUB OF CANADA

MEMBERS ON IMPERIAL WAR SERVICE

L. S. Amery ..... 14th Royal Warwickshire
(Captain, General Staff)
W. A. Alldritt ..... 90th Regiment
(Sergeant, prisoner)
H. Anderson ..... 4th Can. Field Ambulance
(Major, M.O., Croix de Guerre)
Mrs. H. Anderson ..... Nurse
R. G. Annand ..... 21st Reserve Batt. (Alta.)
I. N. Austin ..... 104th Field Ambulance

Rev. W. R. Ball ..... 49th Battalion
(Captain, wounded)
F. C. Bell ..... Asst. Dir. of Medical Service
(Major, M.O., wounded, mentioned in despatches twice)
H. Bennett ..... Divisional Signallers
M. Bright ..... Royal Engineers
(Lieutenant, wounded)
W. E. L. Broad ..... 137th Battalion
(Lieutenant, killed in action)
E. W. Bickle ..... 48th Highlanders
(Captain, wounded)
F. C. Brown ..... 1st Can. Reserve Batt. (B.C.)
(Lieutenant)
W. C. Bruce ..... Canadian Engineers

G. Cameron ..... Artillery, 15th Brigade
K. C. Campbell ..... 43rd Battalion
(Captain)
R. J. Casement ..... Canadian Engineers
(Corporal, D.C.M.)

C. G. Chinneck.....13th Mounted Rifles
J. A. Clark .....72nd Battalion
(Lieutenant-Colonel)
R. P. Clark.....14th Battalion
(Lieut.-Col., Staff Officer, Military Cross, wounded)
Miss M. A. E. Clarke.....V.A.D.
C. D. Creighton .....Canadian Artillery
(Lieutenant)

G. Darling .....King's Royal Rifles
(Lieutenant)

A. Eastham .....
J. E. C. Eaton.....Artists' Rifles
(Lieutenant)

Rev. W. F. O'N. Fisher.....R.A.M.C.
C. E. Fortin .....Lord Strathcona Horse
(Captain, M.O.)
H. W. A. Foster.....20th Battalion
(Major, D.S.O., Military Cross and Bar, twice wounded)
W. W. Foster.....2nd C.M.R. Battalion
(Major, D.S.O., wounded, mentioned in despatches)
T. Fitzsimon .....Princess Patricias L.I.

Rev. A. Gillies-Wilken .....Canadian Mounted Rifles
(Captain, prisoner)
Rev. A. M. Gordon .....4th Canadian Division
(Major, M.C.)
C. W. Gray.....Headquarters Staff
(Wounded)
W. F. Guild.....52nd Canadian Infantry
(Major, died of wounds, mentioned in despatches)
J. A. Gunn .....No. 1 Can. Gen. Hospital
(Lieutenant-Colonel, M.O.)
J. N. Gunn .....R.A.M.C.
(Captain, M.O.)

G. L. Haggen.....Oxford and Bucks Regt.
Mrs. J. W. Henshaw .....
(Hon. Captain)
J. A. Hesketh.....Lord Strathcona Horse
(Lieutenant-Colonel, C.M.G., D.S.O., mentioned in despatches)
G. E. Howard.....Artists' Rifles
(Quartermaster-Sergeant)
P. M. Humme .....Royal Artillery
(Lieutenant)

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Vice-President A.C.C.

MAJOR F. C. BELL
Past Vice-President A.C.C.

J. R. N. Irven.....3rd Battalion, Rifle Brigade
(Captain and Adjutant, wounded)
A. C. C. Johnston.....50th Battalion
(Captain, M.O., M.C.)
S. L. Jones.....Princess Patricias L.I.
(Major, prisoner, died of wounds)
Mrs. S. L. Jones.....Nurse, French Red Cross
(Lieutenant)

F. V. Longstaff .....5th Batt., East Surrey Regt.
(Major)
T. G. Longstaff .....General Staff
(Lieutenant, M.O.)

A. J. B. Milborne.....3rd Field Ambulance
(Captain, mentioned in despatches)
C. H. Mitchell .....Premier Staff Officer, Second Imperial Army
(Lieutenant-Colonel, C.M.G., D.S.O., Officer's Cross, Legion of Honour, Order of Leopold, mentioned in despatches)
Miss M. J. Monk.....Nurse
A. B. Morkill .....7th Battalion
(Lieutenant)
R. C. Morrison.....187th O. Battalion
J. C. McHutcheon .....Sherwood Foresters
(Lieutenant, died of wounds)
W. C. McNaught.....84th Battalion
(Captain)
Jas. G. McDougal.....202nd Battalion
(Lieutenant)
Miss E. McPhedran.....Nurse
E. S. MacGregor .....187th Battalion

G. L. Oliphant .....Battery 71, C.F.A.
(Corporal)
Sir James Outram .....
(Major)
J. C. Oxborough.....12th Can. Mounted Rifles
(Corporal)
W. Oxborough.....12th Can. Mounted Rifles
(Wounded)

R. E. Patterson.....Fort Garry Horse
(Lieutenant)
W. F. M. Pearce .....1st Montreal Regiment
(Major, mentioned in despatches, wounded)

E. F. Pilkington.....6th Batt., Manchester Regt.
(Major)
J. M. Poucher.....51st Battalion
Rev. G. S. Provis.....Attached 15th M.G. Co.
(Captain)

C. B. Reilly.....89th Battalion
(Captain, wounded)
C. B. Reynolds.....9th Can. Mounted Rifles
(Wounded)
A. E. Robertson.....5th G.A.
(Captain)
F. A. Robertson.....47th Battalion
(Major, wounded)
Jas. W. Ross.....Orpington Hospital
(Captain, M.O.)

C. F. Savage .....Northumberland Fusiliers
(Lieutenant, wounded)
Miss J. T. Scott.....Nurse
G. M. Smith .....Princess Patricias L.I.
(Captain, M.C.)
R. H. Smith .....4th Field Ambulance
(Died of wounds)
G. R. Street .....3rd Field Ambulance
(Corporal)

E. L. T. Taylor.....Royal Garrison Artillery
(Lieutenant)
T. J. Taylor.....39th Battalion
(Lieutenant)
J. E. Tilleard.....
F. Trant .....14th Battalion
(Wounded)

S. J. Unwin.....Canadian Artillery
(Sergeant, died of wounds)

Miss H. Walcott .....Nurse
P. A. W. Wallace.....Divisional Signallers
Miss K. Walker.....Nurse
H. Watts .....
(Captain)
A. W. Wakefield.....
(Captain, M.O.)
O. Q. Warren.....Canadian Mounted Rifles
(Lieutenant)

MAJOR H. W. A. FOSTER, D.S.O., M.C.

A. F. Wedgwood .....5th Batt., North Staffordshire Regiment
(Captain, killed in action)
H. Westmorland .....Canadian Mounted Rifles
(Lieutenant)
E. O. Wheeler.....King George's Own Sappers and Miners
(Captain, R.E., Military Cross, Cross Legion of Honour, mentioned four times in despatches)
Rev. G. D. Whitaker .....
(Captain)
E. N. White ..... 1st Batt., Middlesex Regt.
(Lieutenant)
K. H. White.....Motor Transport Service
Rev. R. B. Winser.....
(Captain)
K. D. Woodworth.....Yacht Patrol
(Sub-Lieutenant)

J. R. Young .....H.B.M.G.C.
(Lieutenant)

THE AMERICAN ALPINE CLUB

The beginning of the New Year was signalized by the receipt of a telegram from the American Alpine Club, which, together with the reply of the Alpine Club of Canada, is printed below. The strong sense of fellowship between mountain men has seldom been more strikingly evinced. This fellowship has now spread to the entire American and British nations. It is hoped it may never be broken.

To the Alpine Club of Canada,
Sidney, Vancouver Island, B.C.

We take pleasure in transmitting the following minute unanimously adopted by a standing vote at the Annual Dinner of the American Club:

The members and guests of the American Alpine Club, assembled in the City of New York, while affirming their undivided allegiance to the government of the United States, desire to place on record their deep sympathy with the English nation in the mighty struggle for the liberties of mankind in which it, and its Allies, are now engaged. Although citizens of a neutral nation, we share with the subjects of England those unspeakably great traditions of freedom, of justice and of law, which are the common inheritance from the mother nation of all of the peoples of the English-speaking world. To a struggle which involves the survival of that inheritance we cannot, as individuals, remain indifferent. We desire to place on record our deep admiration of the heroism and self-sacrifice shown by England and its Allies; to express our absolute confidence that such heroism and self-sacrifice insure the ultimate triumph of justice and the continuance of freedom in the world, and to assure our brethren of The Alpine Club and of the Alpine Club of Canada of our deep and heartfelt

sympathy in this hour of their suffering and of splendid self-sacrifice in the cause of mankind.

Chas. E. Fay (President),
R. H. Chapman (Secretary).

[REPLY]

R. H. Chapman, Secretary, American Alpine Club,
2029 Q Street, Washington, D.C.

The Alpine Club of Canada very deeply appreciates the splendid resolution of sympathy with the English nation and its Allies adopted by the American Alpine Club at its annual dinner on the 30th December. We feel that the sentiments therein expressed are worthy of the best traditions of the great American nation, that they are sent in a most friendly spirit and that they will lend strength to our endeavors to carry the war to a successful issue, thereby restoring the rights of small nations and freeing them from oppression and slavery. Copies sent to all sections.

Arthur O. Wheeler (Director),
S. H. Mitchell (Secretary).

GREETING

By Sir Edmund Walker

I have been *directed* (that being, I suppose, the right word to use when the most potent influence in the Alpine Club issues a decree) to write an article for the Alpine Journal. As I am not a writer and know practically nothing about alpine climbing this is, like the ascent of certain mountains, a tall order. Before I begin, however, I wish to express my pride as well as my surprise at being elected Honorary President of the Club, to fill the place of one of the greatest of Canadians, the late Sir Sandford Fleming, K.C.M.G. Although I am not a climber, it has been a keen pleasure to me for many years to be a member of the Club, and no worshipper from a safe distance has more deeply admired its many feats, its climbing, its scientific work, its glorious photographs, its camp life and good fellowship and all the other delightful evidences of what may be enjoyed "far from the madding crowd's ignoble strife," and if I can serve the Club in any other way than by ascending mountains, I am at its command.

I have never doubted the usefulness of the Alpine Club, nor can I quite understand the attitude of those who regard it merely as an association of men and women bent solely on the gratification of their own pleasure, although, even if there were no loftier motives involved, the Club would still rank high among human institutions. We call ourselves a civilized community, but we still know so little about our own country that the exploration and description of our mountains constitute in themselves a great addition to our knowledge and when such descriptions are accompanied by a wealth of photographs, not only of exquisite art as photographs, but portraying objects beautiful, grand,

CAPT. E. O. WHEELER, M.C., R.E.
Croix de Chevalier, Legion d'Honneur

CAPT. G. M. SMITH, M.C.

seductive, terrifying, revealing, indeed, the wonders of our mountains in every phase discoverable to the ardent members of the Club, how can we hesitate to praise? It may be said that we might have all this from enthusiasts who have no real knowledge of mountains, except the art of climbing them, and little perception of beauty beyond what the camera can discover. The Alpine Club, however, has earned most positive distinction by the scientific knowledge its members have displayed in geology and physical geography, in topography and cartography and in the study of the flora and fauna of our western mountains. Canada owes so much to the Club in these respects that I may be excused for urging strongly that its claims to public recognition be more generally acknowledged.

The members of the Club have not in their enthusiastic devotion to its objects, forgotten their duty to the Empire at this grave moment. The last copy of the Journal shows that 89 members of the Club are on active service, a very large proportion, indeed, of our membership. Of these we have lost seven, while sixteen have been wounded and two are prisoners. Eight have been mentioned in despatches, one of them twice and another four times. Six have won the Military Cross, four the D.S.O., one the C.M.G., two the Cross of the Legion of Honour and one the Croix de Guerre. I do not personally know many of those who have gone to the front, but I have been intimately connected with our Vice-President, Lieutenant-Colonel C. H. Mitchell, who has received so many honours—he, I believe, occupies a high military position at the present time never before occupied by a non-professional soldier. There are many splendid records of corporations, clubs and other bodies in Canada, but there are none, I fancy, relatively finer than that of the Alpine Club.

When we write without personal experience about things which others have seen or done, our comments

are apt to smell of the lamp. Like most Britons, I have enjoyed a visit to the one locality in which nature, aided somewhat by man, has arranged a beautiful series of mountains on a scale suitable to man's vision and man's legs: I mean, of course, the Lake Country of England. I have crossed the Alps on my way to and from Italy; I have viewed the vast cordilleran area of North America from transcontinental trains; I have seen many mountains in Mexico in a similarly comfortable manner, and I once climbed the slope of Mount Stephen as far as the Cambrian Trilobite beds; but of the more intimate beauty of mountains, I deeply regret that I know nearly nothing, and of the glorious exultation of seeing the world from great windy heights I know only the more timid delights that may be attained on mountains not many thousand feet high. What can I say, therefore, that does not smell of the lamp, writing in midwinter before a comfortable fire, with books and boxes of prints around me?' I fear—nothing.

In that dramatic period in the early history of the earth when the cooling of its crust had gone far enough to establish the lithosphere and the corresponding hydrosphere, the elements were already fiercely at work tearing down the high parts of the lithosphere and carrying it by stream and river to the slopes and valleys below the hydrosphere. It is, therefore, not strange that these first mountains are now rarely found as high peaks and that they who live in those areas of the earth's surface that are the most ancient usually have to be content with very moderate altitudes although they are often blessed with the most lovely scenery. At later periods, however, throughout the whole geologic column, the throes of the tired earth have caused gigantic ranges of mountains to be formed, and so it follows that we may have mountains in Western Canada with rocks as old as, or older than, the Cambrian, two or three miles in thickness formed by thousands of feet of sediment without

any vestige of life, being at a horizon below the point where organic remains begin to appear and in another range of mountains, just alongside, we may find only Carboniferous and Devonian rocks, and they, by the curious manner in which the mountains were created, may have been pushed partly on top of the much later Cretaceous of the plains. The last stage of this mountain building is, however, so remote, so far as man is concerned, and the destruction by the elements is so slow, that the mountain, wherever it may be, is our most tremendous phenomenon, our hoariest monument of time, the object sometimes of our worship, sometimes of our fear, always of our admiration, while its counterpart, the abysmal valleys under the ocean, covered with the slime formed from the wastage of the mountains and carried down by the rivers, creates in us little but horror, and a terror-bound sense of mystery.

As a rule, man in his early stages feared and avoided the mountains and where he has found a more or less permanent home among them his ancestors have been driven to live there because of more powerful enemies who have seized the valleys or the plains. Such mountain men are often degenerate, antique in habit, and profoundly different from the ordinary man. True, in time, the valley man sometimes grows fat and lazy and the mountain man, like Kintoki, sometimes acquires all the strength that comes from contact with nature, and her wild beasts, and so many a hill-man coming down upon the vale of Cashmir, upon the fishing Indians of our Pacific coast or upon the lowland Scotchman, has in effect sung the War-Song of Dinas Vawr—

> "The mountain sheep are sweeter,
> But the valley sheep are fatter;
> We, therefore, deemed it meeter,
> To carry off the latter."

We should be wrong to suppose, however, that men dwelling in the mountain areas have necessarily been

driven there by other men. Sometimes they have, like the plants and lower animals, sought the higher ranges to escape the heat of the plains, sometimes they are the survivors of races that, having always been accustomed to cool or cold climates, cannot exist at the warm levels.

I recall the description of a Canadian missionary who lives in Thibet, the most elevated country in the world, where the valleys are from 12,000 to 17,000 feet above the sea, the passes 16,000 to 19,000 feet and the peaks 20,000 to 25,000 feet. The people whose condition he is seeking to improve, sleep in tents, own no land, dress in skins, have no written language, no form of money, no furniture, are pure nomads, and apparently exist only for the sake of their herds of yaks, the only kind of wealth they care about or understand. These nomads are not very different in the scale of civilization from a certain inhabitant of our country in the scale of biology. On the talus of Sulphur Mountain, Banff, under a stone at an altitude of 6,500 feet, a wingless insect was recently found which is so generalized in structure that it combines the characters of the cockroach, the earwig, the white ant, the cricket and the grasshopper (Grylloblatta campodei-formis Walker).* Like the Thibetan nomad in the "Icy Land" this ancient form of Canadian life, with no near relatives in the ordinary fauna of the world, has survived with little modification in structure since palaeozoic times because its ancestors became adapted to conditions where little competition with other species existed.

To many of us the mountains are associated with loneliness, with that solitude which excludes the world and brings us face to face with our own souls. The great scale of our glaciers, the terribly destructive force of heat and cold and all the other enemies of mountains, the starved life and the vast areas where there seems to

*"Grylloblatta campodei-formis Walker" was discovered by Mr. E. M. Walker, Sir Edmund's son, who is an entomologist of very advanced knowledge. A description was published in the "Canadian Entomologist," Vol. 46, No. 3, March 1914, pp. 93-99.—Editor.

be no life, and finally the enormous number and size of our mountains, make us forget that every mountain is, more or less, an island of the Arctic left in the glacial period and is thus sometimes a refuge for fragile things such as the White Mountain butterfly, which flutters among the rocks close to the ground, and when it settles leans over on one side as if to avoid the wind.

Man in Canada and in the greater part of the United States has shunned the mountains. To him their grandeur and their solitude are associated with the trials of those who first ventured to cross the few passes that were practicable in pre-railroad days. The glimpse of the mountains by Verendrye, the heroism of Mackenzie, the tales of the fur-traders, the discovery of Rogers Pass are remembered by every Canadian, while Americans have their Lewis and Clark, their Pike and others. In Mexico and the southwestern part of the United States, the mountains presented, at all events to the Indian, a different aspect. In Arizona and some neighbouring states man sought safety, as he did in many parts of Asia, by building his home in mountain caves or on mountain shelves backed by cliffs, so that he could keep out the enemy by the simple expedient of hauling up the ladder which constituted his front-door steps. The sufferers on the fever-stricken sea levels of Mexico sought the table-lands for relief and naturally loved the mountains, so that the Aztec turning from the sea to the glorious "Mountain of the Star," which we call Orizaba, could see its perfect cone in the early morning suffused in golden light, or changing with every hour of the day, now crimson, now violet, always present, overpowering, all pervading, and filled with religious awe he prayed to his gods that his spirit might finally rest in the sacred mountain. Ancient Mexicans of all races revered their mountains, built towns at their bases, called them by names significant and often mysterious — not such meaningless names as we often use—and very naturally

worshipped a peak of such surpassing beauty as Orizaba, as the Japanese worship Fujiyama.

The mountain climber, breasting the slope, does not always realize as he notes the rapid changes in flora and fauna that he has been able to pass on a small scale through all the changes which he would find on the level earth by travelling from his temporate or tropical land to the Arctic. Perhaps the best example of this perpendicular range of climate is to be found in Bolivia, where, in the torrid zone, we may meet with every gradation from the tropical heat of the lowlands to the arctic cold of the snow-capped peaks. Here, surrounded by the Andean Cordilleras, of which at least eight peaks are over or about 20,000 feet in height, lies Titicaca, in some respects the most remarkable lake in the world. While it is 12,500 feet above sea level, its maximum depth, 924 feet, is greater than that of any of our great lakes, except Lake Superior. Its area is estimated at from 3,200 to 5,000 square miles, and around this centre of interest there developed a complicated civilization which reached its height before the Aymaras were conquered by the Incas in the thirteenth or fourteenth century. To the Incas the shores of Lake Titicaca became a "holy land" which they regarded as the source of all civilization, and when we compare their skill in weaving, in decorating pottery, in working gold and copper, in sculpture and most noticeably in architecture, with that of the Thibetans, living at about the same height, surrounded by the lore and the art of the most ancient civilization in the Eastern world, and yet remaining mere nomads, little altered in their habits during, perhaps, five or ten thousand years, we can realize the difference between the weak who live in the mountains because their stronger brethren have seized the better *lower* country and the strong who have abandoned the lower and have pushed their way into the better *higher* country.

Let me now turn from my books to my prints and

close this article with a few words about the "Peerless Mountain" which so profoundly influences the poetry, the plastic art and even the religion of those laughing children of the sun, the people of Nippon. They are pleased to believe that at a date equivalent to our 286 B.C. an earthquake by one effort produced the two most beautiful things in the world, Lake Biwa and Fujisan or Fujiyama. As we can readily see these two objects were ever in the mind both of Hokusai and of Hiroshige, and no one can even glance at a collection of objects of Japanese art without seeing that exquisitely simple cone, with its gleaming snow cap, always isolated and remote; and if we look a little more closely we can hardly escape seeing the beautiful lake with the wild geese flying over it, or the sail boats moving on its surface, or the rain, or the moonlight, or avoid fancying that we can hear the bells of the temples sounding across the lake at eventide. Among the countless prints by Hiroshige few are so beautiful as the eight landscapes of Omi, the province in which Lake Biwa is situated. In the earlier work by Hokusai the "Thirty-six Views of Mount Fuji" are the most important. There are as a matter of fact forty-six views in the set, of which I am glad to own twenty-six. From these prints one learns that all there is of life and Nature centres round Fujiyama, or at least that life is in no case complete without the peerless mountain. Elsewhere you may find him at the bottom of a saki cup or a tea bowl, or he may be blessing the handle of a tea-pot, his silver form embedded in the bronze, or he may be a tiny image in gold or silver laid into the steel of some sword, or he may shine through the windows in one of Harunobu's love scenes, but to Hokusai he is the sentinel who watches over every aspect of life. In some of his prints, perhaps, we are close to Fuji, and the red mountain in fine weather towers against a deep blue sky, or a storm is raging and the lightning plays round its base; in another across the sea in the huge waves of

which sailors are fighting for their lives, rises in the distance the type of what endures, looking down at man's transitory struggles; in others every phase of Japanese landscape appears, the work of everyday life is going on—sawyers are cutting up great timbers in the woods, men with their puny arms are measuring the girth of a giant cedar, pilgrims are seeking the mountain or some wayside temple, a cooper is making an irrigation tank, oxen are hauling wood, fishermen are casting a net—it matters not, the silent Fuji is there. Man pursues his varied occupations in the temples, in the teahouses, in the houseboat, in the pagodas, in cherry time—he cannot escape the vigilance of Fuji; he may be humorous, as in the picture we sometimes call "The Puff of Wind"; he may be watching the wild birds flying across the sky, as they so often do in Japanese pictures; he may be occupied in guessing the wonderful age of the famous pine tree—it is all one to Fuji. Even when Hokusai in his most impressionistic vein makes earth hang in the shining air and gives to physical things a dream-like beauty which no Western artist has achieved, Fuji in all his massive solidity cannot be ignored—he is there to warn, he is there to encourage, he is there to proclaim the value of beauty, he is there to guard Japan.

With us Nature has been too generous. Man will settle in our valleys and the mountains will be near them in many ways, but with our scientific spirit and our modern efficiency we shall proceed to tear the heart out of the mystery, our mountains will doubtless be placed most accurately on our maps, will be minutely classified as to their geological constituents and as to all phenomena connected with them, but by that time men will have ceased to look for them as a blessing at the bottom of the wine cup and to sigh to be entombed in one of them as a guarantee of life hereafter.

MOUNTAINEERING SECTION

THE HOWSER AND BUGABOO SPIRES, PURCELL RANGE

By A. H. MacCarthy

FIRST ASCENT OF HOWSER SPIRE

At the head of the Bugaboo Creek, which joins the Columbia at Spillimacheen, Bugaboo Pass carries over into the Howser Creek Valley and to the north of this pass, beyond a long ridge of six peaks, running up in altitude to about 10,000 feet, which suggests the name of Sextet Ridge, is the wonderful outcrop of granite spires spoken of by Doctor T. G. Longstaff in his article "Across the Purcell Range of British Columbia," which appeared in the 1911 Canadian Alpine Journal.

No map of this section has ever been published and it still remains little known, the only available data concerning it being that given in Doctor Longstaff's article wherein it is stated that the highest peak of the group is but 10,244 feet in elevation. This determination was made from the survey work done on this trip by Mr. A. O. Wheeler, and it, therefore, is certain to be accurate, but it has been suggested that from Mr. Wheeler's points of observation he may not have been able to read angles on the highest peak and so obtained the above result with regard to the spire lying to the east of the highest peak. This, however, seems improbable, for opposite page 35 of the 1911 Journal the upper photograph shown is that of the highest peak as seen from its southwest side, and if this is the peak to which Doctor Longstaff refers then all the readings of two aneroids, which heretofore have given very satisfactory

results, must be pulled down about seven hundred feet in every observation recorded below.* This massive spire and its many worthy companions show up very prominently from "Sir Donald" and other high peaks and offer an excellent field for a two weeks' expedition. Even though their altitudes may be somewhat in question, there is no possible doubt concerning the many difficult climbs they afford.

On the afternoon of August 25th, 1916, after a two days' easy trip by pack train from Spillimacheen, our party, consisting of Mrs. George E. Vincent, John Vincent, H. O. Frind, Mrs. MacCarthy and the writer, with Conrad Kain, guide, and two packers, camped at an elevation of 5,000 feet at the head of the north fork of the Bugaboo in the forest about a mile below the foot of the glacier flowing from a vast snowfield, through which the spires bristle on all sides. From the valley below it was possible to see but few of these spires, and speculation was great as to which one, if any, should prove to be the massive fellow that had beckoned to us from every high peak we had climbed in the Purcell Range during previous expeditions.

The field for exploration was great, so we started at five the next morning, determined to locate a spot for a bivouac, to discover our peak and to explore a route to it if nothing more. The first two and a half hours to an elevation of 7,000 feet was the usual work of ploughing through dense undergrowth, crossing and recrossing small streams, and diagonally traversing a much crevassed dry glacier to mossy slopes up a steep face which carried to the level of a glacier-bed above tree line.

*The altitudes obtained by Mr. Wheeler at the time of his visit to the Bugaboo-Howser country with Dr. Longstaff, in 1910, can only be accepted as approximate. Unfortunately, cloudy, wet weather at the close of the survey, late in September, prevented his making connection with a point definitely established in altitude. On the other hand, altitudes obtained by the readings of a travelling aneroid barometer are subject to the variations of atmospheric pressure and cannot be considered as final.

Howser Peak, so called by Mr. Wheeler, is the one directly on the east side of the Bugaboo-Howser Pass, and is lower than the peak referred to by Mr. MacCarthy as Howser Spire.—Editor.

From here we received our first impressions of the vastness of this granite region and the great number of climbs it offers. To the northwest in a row the three spires referred to by Doctor Longstaff as "The Nunataks," shot out of the glacier, so we designated them from south to north, Numbers 1, 2 and 3; to the west beyond this line several other peaks showed between these three, and several more rose on the east of them. All these spires presented more or less the same appearance and several seemed to be of about the same height, so at Conrad's suggestion we crossed the glacier to the east of the three and ascended to the summit of the saddle between Nos. 2 and 3, which we reached at 9 a.m., the barometer reading 8,650 feet. And now a still grander view lay before us: a broad, more or less circular glacier stretched out and rounded up to rest on the sides of several beautiful spires along its south edge, one of them with its outline capped by an image of a pouter pigeon; at its west side it ran up high on the walls of a lofty ridge that stood in a semi-circle with five sharp peaks vying with each other for leadership, and down in the center of this glacier a long, low ridge showed just above the snow, like a half buried train of cars.

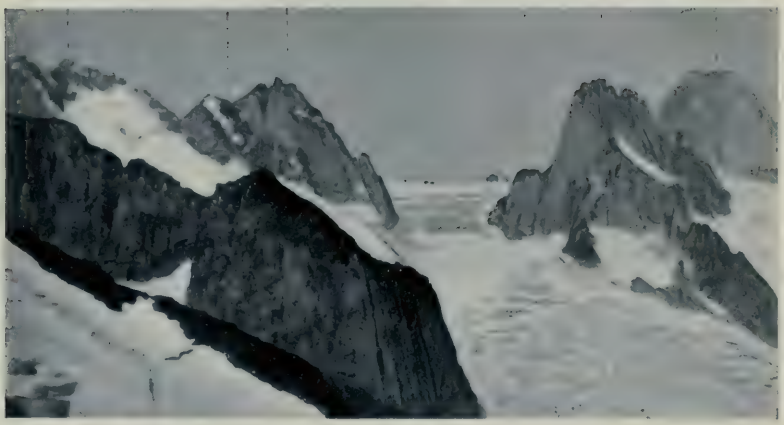
Again, speculation was rife as to which peak was the ruler of this mighty array, and, as we were too close under Nos. 2 and 3 to see their summits, we crossed to the centre of the glacier to get a clear view of all of them to settle this all important question, I devoutly hoping that No. 2 would not be chosen; for, with the sheer cliffs on all sides we had seen, it seemed clearly impossible. The decision lay between No. 3 and the third peak of the circular ridge to the west. Opinion was about equally divided, and we finally decided to try the peak on the ridge, little realizing that Nature had clearly indicated it to be the ruler, for later we found at the west end of the train of cars a perfect profile of the

sphinx gazing intently at its master. This clear-cut image suggests the name of "Sphinx Glacier," as "Howser Glacier," doubtless should designate the glacier on the west side of the mountain that is the source of Howser Creek.

Conrad laid a course along the south side of the glacier towards Pigeon Spire until we reached a line of bare rocks that edges the drop into the deep cut south of the first peak of the ridge; here we rested near a small waterfall while trying to make up for the sweltering effect of a glaring sun on the snowfield, and Conrad examined the mountain side to choose his route. We then worked over and up to a point at the base of the bergschrund below the saddle between the second and third peaks, where we had our first thrill in climbing up the vertical face of the upper lip of the schrund: about ten feet of deep steps in soft snow with hard jabs into it for handholds.

The slope above the bergschrund had but a light coating of snow over the ice and seemed so steep that our estimates ranged from sixty to seventy degrees, but when the clinometer was placed on the stock of an ice axe laid on its surface it showed an angle of but fifty-two degrees which, of course, was a distinct disappointment at the time, but long before we reached the rocks above, at 11 o'clock, all hands conceded that a fifty-two degree slope was sufficient. The first bit of rock work was a six-inch crack between a high, blank wall on the right, and on the left a steep, smooth slab of twenty feet lying at an angle of forty degrees. There were no hand or footholds on either side and it was interesting to note results of the different methods of attack. Taking it in what seemed to be the natural way, with the right leg in the crack and hands on the edge of the slab, one was forced to shin up, twisting the right knee in the crack to hold position for the next pull, and the rucksack jammed the wall and made the pull doubly hard; whereas, by

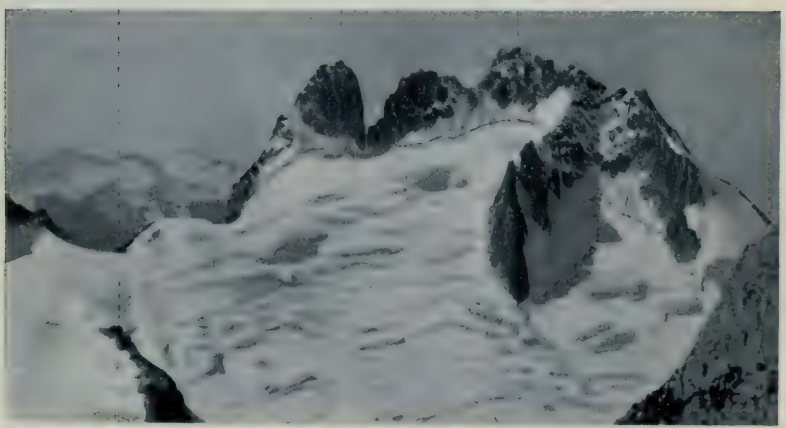
Howser Group No. 1 Pigeon Spire No. 2 Bugaboo Spire



Photo, A. H. MacCarthy

THE HOWSER AND BUGABOO SPIRES

The Sphinx South Spire Centre Spire



Photo, A. H. MacCarthy

THE HOWSER GROUP
From Bugaboo Spire

tackling it apparently in an awkward way, with the left leg in the crack and sitting on the edge of the slab, the rucksack swung clear above it, and with the right foot placed squarely against the wall, the hands and foot made the boost easy, while the seat on the edge gave a comfortable rest between efforts. No doubt the divergence of opinion with regard to the difficulties experienced on a particular mountain is greatly due to the different climbing methods employed on its various stretches; a little study of mechanical gymnastics often turns a fearsome stretch into an amusing one.

Three steep snow cornices along the sharp edge of ice ridges then came in rapid succession until we landed in a narrow, horizontal crack at the top of a huge slab that had just begun the descent to its final resting place at the bottom of the valley, where all its companions above were ultimately to join it. Those on my rope were fortunate in having this secure stand, while the members on Conrad's rope were forced to stand in narrow ice steps, one foot at a time at the beginning of a mighty ice couloir that seemed to run almost straight up and down, while he cut steps diagonally across it to gain the base of the ridge above. Probably the thoughts which came to one member of the party while thus poised on one leg, with the other dangling over green ice, contributed their part to a declaration made later on the summit about a mountaineer never knowing when to quit.

A rapid climb up the ridge landed us at 2.15 in the cut between the second and third peaks; it could hardly be called a saddle for it dropped off sharply on the other side, affording us little room for comfort while resting and eating our luncheon. The barometer showed an elevation of 10,450 feet and, levelling back at No. 3 peak, we saw that already we were above the level of its summit; our guess had proven correct, we were making for the highest peak of the group. The formation

on opposite sides of this mountain was in marked contrast; the whole east face, although very steep, was much broken from summit to glacier, while on the west side it dropped in one sheer cliff for several thousand feet to a small, nearly flat glacier at its base, presenting a face that would defy any sort of an attack. While at luncheon we were amused at the frank curiosity of a small mountain squirrel which ran about on the rocks chattering at us in a most friendly manner, finally coming within a few feet to enjoy its noonday meal of lichen, thus showing it did not believe man's treachery would carry to such heights. It certainly could not have had a permanent home so high above earth and vegetation, and this day must also have been on a tour of exploration.

At three o'clock we began working up the arête, frequently being forced to divert to the east face to avoid smooth boulder sides, and at 10,750 feet our only apparent course carried us through a very small window back of a huge boulder that capped a short rib below. Besides being a tight squeeze for a man and rucksack it had no sill on the opposite side, the footing being a narrow slab edge along the mountain side at right angles to the window, an arrangement that did not commend itself to us as being good architecture. From this point up, there was a series of broken chimneys and a long stretch over uniform water-washed and pitted slopes to a snow cap and a few dry slabs at the summit, to which Mrs. Vincent led us at 4 p.m., our barometer reading 10,950 feet.

While Conrad built a cairn of the few small rocks that were available, in which to deposit our record, we speculated as to the best route down and discussed the possibilities offered by the other spires; and when Mrs. MacCarthy suggested that No. 3 looked very inviting and we should attempt it, we were astonished to hear the most enthusiastic member of the party say, if she got down from this peak alive, Howser Spire certainly would

be a memorable peak for her, as it was the last mountain she would ever climb. How one's point of view changes with a change of surroundings, the real psychology of the mountains! This very positive soul, two days later, spent fifteen hours in a traverse over all the summits of the Sextet Range and on the way to camp climbed twenty-five feet down into a fearsome crevasse in order to cross it, and never once lost her cheerful smile.

At 4.50, true to habit, Conrad turned his back on our route up and led the way northward along the ridge and down the steep, broken arête and snow patches to the first big gendarme, and then down the east face until, at 10,475 feet, we reached the snow slopes above the bergschrund at 6.40 p.m. Just below our last rock stand the bergschrund was extremely wide and necessitated a horizontal traverse on a 55-degree slope for about two hundred yards to a point below a small water course that had caused a snow slide and left a shute two feet deep to mark its wake. The snow from this slide Conrad figured would so fill the bergschrund that it would afford us a safe passage. The slope was too steep to heel down with safety, so we faced about and backed down, and the 160 toe steps, one member moving at a time with ice axe buried at each step, took a long time to negotiate, but it landed us safely at the upper lip of the schrund where we found a drop of twenty feet to the lip below with a ten-foot gap between it and the rock face partially filled with snow.

In the shute, a few feet above the edge, Conrad drove his ice axe to the head and then passed a double rope over it, letting the two ends run over to the lip below, and, one at a time, the members of the party were lowered from a turn of his own rope around a second axe, each dropping hand over hand on the double rope for security until he landed. It was now up to Conrad; he had intended to jump down, but the distance seemed great and the narrow landing broke sharply down the

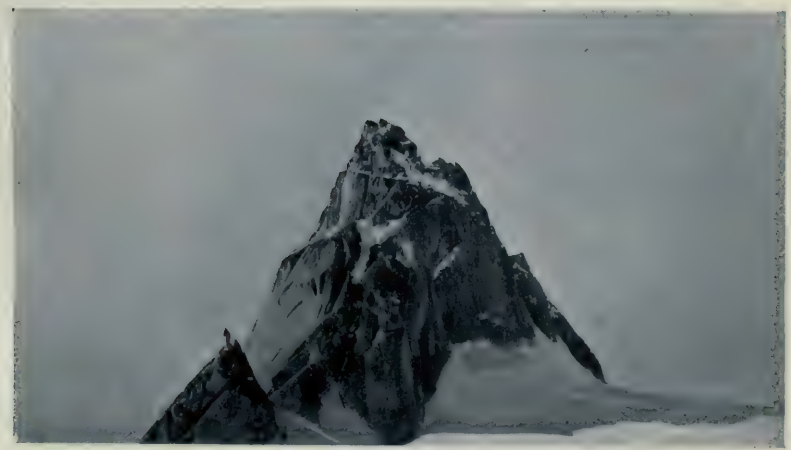
névé, and this combination suggested the possibilities of a sprain or a broken leg, so he revised his plan. The ice axes were lowered and he then passed the loop of the double rope over a large mass of snow with his coat tied at the turn to prevent the rope cutting through, and came down hand over hand in safety.

At eight o'clock we were again roped up and set off at high speed for the pass between Nos. 2 and 3, and reached it at 8.45, catching the last rays of the afterglow from a most brilliant, crimson sunset. Our footsteps of the morning across the eastern glacier were easy to follow, and we gained the edge of the high grass plots at about 9.30, just as the sky became streaked with northern lights, the display shifting every few minutes and finally covering the whole heavens with most wonderful shapes and patterns. For a moment the sky would be black, then a bright spot would appear and from it would radiate shafts of light in all directions. These shafts would quiver, contract and then expand until they almost met, then contract and from their common centre quivering rings of light would run out with incredible speed like waves and cross-bar the heavens: suddenly all would be darkness again, only to be broken in a moment when the display would take on still other forms. If the climb of the day was really to be the last for any of us the heavens joined in for an hour with their mightiest display to mark the occasion.

The head of the east lateral moraine was reached at 10.30, and we had easy going along its sharp edge until we struck the bush and tree growth, where, in the darkness, we found great difficulty in securing footing around it. At a point where the face of the moraine drops abruptly on the glacier side, a twig failed to measure up to the demand placed upon it, and Mrs. MacCarthy suddenly disappeared in a cloud of dust; and here again I was impressed with her speed in the mountains, for my quick pursuit was of no avail, she had shot down

Photo, A. H. MacCarthy

SOUTH SPIRE OF HOWSER GROUP
From South-Southwest



Photo, A. H. MacCarthy

PIGEON SPIRE

between two lines of boulders and calmly awaited my arrival forty feet below the ridge, neither of us being even slightly injured, and having in the darkness performed a feat that neither would have essayed in daylight. Replying to Conrad's anxious inquiry, that we really preferred a lower line, it being dangerous to try to ascend such a face, we continued along the edge of the glacier to its forefoot and there waited half an hour for the rest of the party to join us, they having continued along the moraine and having found it very tiresome and difficult.

Our plans as formulated in the morning did not reckon with a night expedition, so no clear trail was blazed from the camp to the glacier, and this oversight caused us many scratches and bruises in our plunges through the dense brush and pines before we reached camp at 1.05 a.m., where Charlie Stewart still kept warm our delicious supper, that had lost none of its flavor by the delay in serving.

FIRST ASCENT OF No. 3 PEAK, OR "BUGABOO SPIRE"

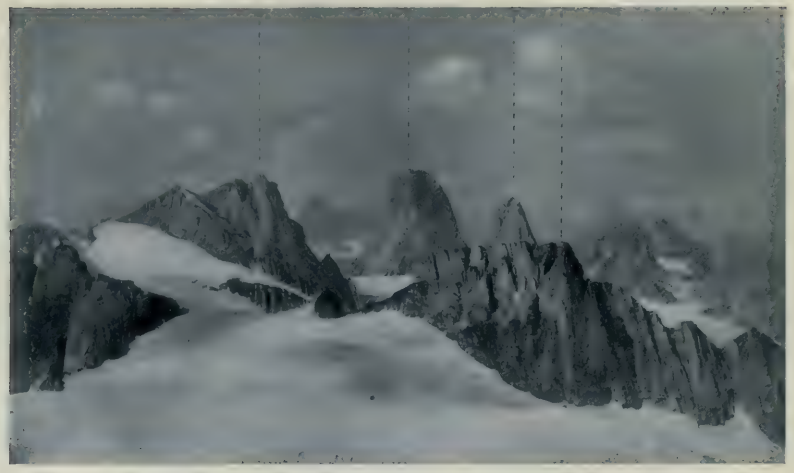
On August 29th, the day after our traverse of the Sextet Ridge, Mrs. MacCarthy, John Vincent, Conrad and the writer left camp at 4.30 a.m. for a try on No. 3 peak, which we erroneously imagined was the one on which Dr. Hickson, of Montreal, had made an unsuccessful attempt during the latter part of July. Later we learned that, with Edouard Feuz, he had tried the main ridge of spires, ascending the north arête but was driven back on account of snow conditions after reaching the base of the last big gendarme. The weather was not promising, but by the time we reached the saddle between Nos. 2 and 3, the clouds had broken and we were favored with sunshine for most of the day.

Crossing the eastern glacier close along the cliffs of No. 2 peak, they presented a most forbidding aspect, as if trying to scare us from any search for a vulnerable spot that may possibly lie on the southwest side of the

mountain between its main mass and a low lying shoulder.

The lower reaches on No. 3 above the saddle, for about 1,200 feet, varied at angles from 30 to 60 degrees, with two thirty-foot chimneys and one smooth slide, the whole stretch affording every possible kind of interesting rock work. Up the easier parts of these stretches Conrad set a fast pace with John trailing close behind him, while Mrs. MacCarthy and I, following close behind her to avoid the necessity of using a rope, took a more leisurely gait.

The *pièce de résistance* that took nearly two hours to negotiate was reached at an elevation of 10,000 feet, and here the laggards again rejoined Conrad and John, who sat below it nonplussed at the sight of a veritable bugaboo, which immediately suggested to our minds the appropriateness of the name "Bugaboo" for this spire. Our route was completely blocked by a most formidable gendarme, whose base completely spanned the width of the ridge. Its wall on the west side ran up in prolongation of the mighty cliffs that rose from the glacier far below, and its top edge rose sharply like a horn to the point where it joined the high sheer east wall. The side to the west was blocked by the cliffs, and on the east side a broken section led down directly below the east wall for about forty feet to a ledge four feet wide that ended with a 2,000-foot drop, while above this ledge, although the face was broken, there seemed to be no safe line of ascent, and Conrad finally decided that the face of the gendarme offered our only hope. Relieving himself of his rucksack, he gradually worked up this face by means of several diagonal cracks until he succeeded in getting both arms over the top edge, and here he stuck for a long time, feeling about and looking for some little thing that might afford him a hold long enough to pull himself over; at last he found it, although it was not apparent to us when we followed, and slowly crept over the edge,



Photo, A. H. MacCarthy

GROUP OF SPIRES, SEEN FROM SOUTHWEST

Photo, A. H. MacCarthy

GENDARME ON BUGABOO SPIRE

Photographed about 500 ft. below

much to our relief, for we supposed the difficulties were ended, but they had really just begun. Half an hour we waited while Conrad's body disappeared and reappeared at the edge; after each disappearance we expected to hear a shout that we could prepare to follow, but each time Conrad's fingers would slowly creep into sight and then he would appear again to survey the situation and make a fresh start. The whole trouble, he explained, was due to the lack of any sort of hold or footing on the steep, smooth face for a distance of six feet to a crack beyond, and as it was impossible to throw the rope over anything to give him support and the ice axe had proven unavailing, he was forced to depend entirely upon himself with no certainty as to what position he might find himself in when once in the crack. It was evident from his persistent efforts that he was determined to make it, and all we could do was to tend the useless rope, giving him slack and pulling it in again when he came back into view. Just how he finally got into the crack is a mystery to us but, after a dozen reappearances, he smiled and said: "I make it," and soon began to call for rope, until about sixty feet had run out and he called from the top of the ridge above the gendarme. We then bent on two spare ropes and with the aid of a double rope went up, one at a time, fully realizing, as we passed over the top stretch and up the broken course above, that the real climb on a mountain is the one made by the guide, who often must take his chances without assistance from any helping hand. We also felt confident that Conrad would not descend over such a stretch if any other possible route could be found.

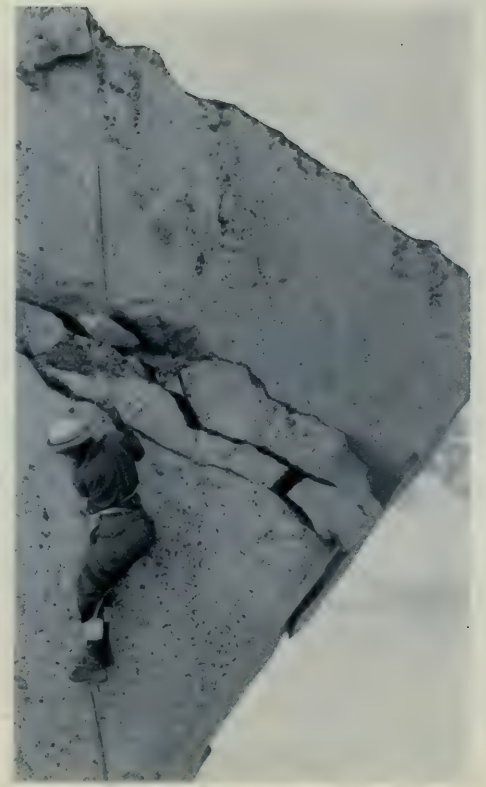
The distance from here to the first summit was short and ended with a good climb up a right angle corner at the junction of two rough walls, and John led us to the summit at 12.45, the barometer reading 10,250 feet. We levelled across to the other summit, lying a few hundred yards to the northeast, which appeared to be a few feet

higher; so, after having a snack and building a cairn for the record, we started for the second summit, soon to be stopped by the sudden termination of the top mass which had run along on a level for a short distance and then dropped a little until its side cut sharply back for thirty feet or more, thus leaving the ledge pointing out into space over the glacier far below. Twenty feet down, where the receding side again joined the vertical cliffs underneath the overhang, a sloping slab lapped the cliff a few feet; so, with the aid of a double rope passed over a convenient rock, we dropped down to this level, the rope being left for use on the return trip.

Horizontal cracks on the slab carried us to a broken causeway with sections of it only a foot or two wide, which were topped with a rounded edge, making a straddle the only safe method to negotiate them. Three or four sharp rises and a short irregular chimney landed us on the summit at 2.40; forty minutes of work to find the barometer reading exactly the same as on the first peak, 10,250 feet, and the first peak now appearing a little higher than the second one, a trait that nearby peaks seem to have to lure one on.

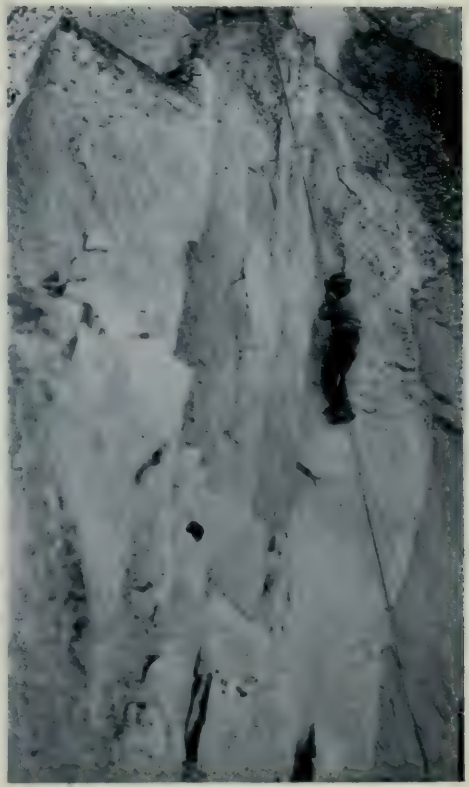
The trip back to our rucksacks was easily made, each going up the double rope hand over hand to show that he was fit for the return journey, and at 3.20 we started down, all interested to see what was to be done at the gendarme.

Fortunately we had three ropes along, two of eighty feet and one of a hundred and twenty feet; so, after a survey of all sides, a route down the cliffs back of the gendarme was chosen and a double rope was passed over a projecting rock with Conrad's coat underneath to serve as chaffing gear for the loop and for the lowering rope. Half way down the eighty-foot stretch and a little out of line with the hanging rope a small ledge projected from a side wall, which offered a chance for a rest, but, as this and the narrow sloping ledge below were



Photo, A. H. MacCarthy

MRS. MacCARTHY on ROPE GOING FROM FIRST TO SECOND SUMMIT, BUGABOO SPIRE



Photo, Mrs. A. H. MacCarthy

A. H. MacCARTHY, DESCENDING 80 FOOT DROP BEHIND GENDARME ON BUGABOO SPIRE

insignificant edges above a 2,000-foot drop, no one cared to linger on the rope, but came down as quickly as possible, taking a turn of the double rope around a leg and pinching it between the feet to relieve the strain on the single rope. Conrad being the last to come down did not have the aid of a lowering rope and had to depend entirely upon his hands and the turn around the leg; but so long as the rope was kept securely pinched between the boots there was little danger, for a slight pressure on it will hold the weight of the body and relieve the strain on the arms.

The broken section carried us up forty feet to the base of the gendarme with just one hour spent in getting down its forty feet of height, and this gave us ample time to enjoy the many good short stretches that had annoyed us with delays during the morning. We also deflected from our route to try a short cut to the glacier, but were driven back by an unbroken row of cliffs that rise along the east side. Camp was reached at 8 p.m., and the next day we reluctantly turned our backs on the many spires whose intimate acquaintance we had not made, but with a resolve to return to them at the first good opportunity.

THE CARIBOO MOUNTAINS

By E. W. D. Holway

"From many of the Rockies further south I had seen the Selkirk range, but they are not, in my opinion, at all equal to the Cariboo group. Up to the present, as far as I know, not a white man has ever penetrated into its fastnesses. I have heard stories of how even the most adventurous of prospectors have been turned back. Any one who has attempted to reach the high mountains on the west of the watershed, either in the Selkirks along the Columbia River or in the Rockies, knows that he will never try again."—J. Norman Collie, Alpine Jour. 26: 8-9, 1912.

When I read this I immediately decided to have a look at them. Some years' experience in carrying a pack in the Selkirks had shown me that nothing there was impassable if one was sufficiently interested to make the hard work a pleasure.

In the summer of 1916, after a delightful, although a rainy trip up Swiftcurrent River, the ascent of Mt. Longstaff and of other peaks and passes, completing the previous season's work in that region, Dr. Gilmour and I decided to see the Cariboos. For the first time we had had fine views of them and were able to locate high peaks and great glaciers at the head af Sand Creek, which flows into the Fraser near Tête Jaune. We selected this valley for the further reason that, owing to the mica mines on Mica Mt., there was a horse trail for six miles. There was also said to be a trapper's trail for a few miles further.

Buying our provisions at Jasper, we took the morning train to Tête Jaune, where we were met by a man engaged to help us pack. The horses were to have been ready also, but high water had taken out the bridge and they were on the wrong side of the river. A half day's work failed to get them over, but luckily we discovered that there were two others, and at 3 p.m. we were on the trail. Just at dark we came down to the creek, which

was as far as the horses could go. There was barely room for us under a high overhanging cliff, the river roaring by like a great fall with constant booming of boulders. We arose early and hung up by a wire out of reach of bears and porcupines all that we could not get into our packs.

Our camp was 3,400 feet, 1,000 feet above the railway, but beyond as far as we could see it appeared to be nearly level, and we found the tongue of the great glacier, eight miles further, in the end of the valley, to be only 4,200 feet.

The going the first day was fairly good as some alders had been cut and we made five miles. The second day at 4 p.m. we located a camping place a few feet above an old stream bed, near the tongue of the glacier, having worked hard to make three miles. It was fortunate for us that it was elevated a little, for one night I heard water running below the tent and we found in the morning that a great stream had broken out at the side of the glacier some way above the tongue and that all the old channels were full. After about thirty-six hours it ceased. Evidently a lake beneath the ice suddenly found an outlet.

The valley is very sharply V-shaped, and looking back from the tongue of the glacier, Mt. Robson just filled the opening. This was often a glorious sight at sunset. One evening a great hat-like cloud, in all delicate colors, covered the summit, while just below there was a broad band of red with perfectly parallel edges. Higher up we could see all the Robson region.

Our first task was to see if a high camp could be found, but glaciers, cliffs and steep slopes everywhere rendered it impossible, and this is the case in the valleys both east and west. It is a far more difficult country to get about in than the Selkirks. Such passes as exist are very high and hard to carry packs over.

Three miles below camp on the east is a fine waterfall coming from a hanging valley leading up to two black peaks with glaciers below the summits. Two miles further down a glacier descends to the valley level. At the head of the valley are several great peaks, 10,500 to 11,000 feet or more, with glaciers everywhere and a wonderful cirque, the back wall of which is very high and too steep to retain any snow.

On a day of rain, snow and mist, we explored the big glacier. For three miles the ascent is gradual, although the ice is much crevassed. Then came a splendid ice-fall, one of the most beautiful I have seen, and a wonderful névé many miles wide. We reached the col at 9,400 feet and ascended a peak of 9,800 feet and looked into a branch of Mica Creek, the most magnificent valley that I have ever seen. Great glaciers and high peaks at the head and glaciers everywhere on the sides as far as I could see, all uniting in a valley glacier of unknown length. Mists were so thick that only momentary views were possible. The glacier that we had come up was about six miles long, with many side glaciers feeding it.

One lovely day while the doctor remained in camp I repeated this trip alone, obtained photographs and discovered a way down, very difficult with packs, but possible.

The next day I again explored alone, ascending the glacier for two miles, climbing above the ice-fall of the side glacier and following this up the fine second fall to the pretty cirque high above. The walls of this could be climbed, but a great avalanche of ice from the mountain above came down just then and went far out on the névé so that I went up the mountain on the west, descended by very steep cliffs and found a pass further west that led into a great cirque now only partially filled by the decadent glacier.

The next day I came again to this pass with the doctor and we went down into the cirque and out on the south

wall where we looked down on the Little Shuswap (Kiwa) glacier apparently coming from the northwest face of the highest peak at the head of Sand Creek and going out of sight in the valley bottom. We could not see far towards the head of the valley, but it must be magnificent. From the pass we saw part of the northwest face of this peak, all ice covered.

While seated at the top of the cirque we saw a porcupine coming up the very steep snow beneath us. He heard our talking and carefully raised himself a little and looked at us. He evidently disliked our appearance for he turned head down the slope, but slipped, so he faced up again and very carefully kicked steps with his hind feet all the way down, making several kicks to a step, just as a climber would do in such a place.

We saw from the Mt. Robson region other great peaks and glaciers further west, but the rivers flowing from them into the Fraser are longer and the difficulty of reaching them from the side of the railway greater. We saw nothing, however, to prevent experienced parties in exploring all the range. It is not a short trip affair. It is useless to attempt it unless one has the entire season.

The climbing is a fine combination of interesting glacier work and narrow rock arêtes, which are quite likely to be icy and covered with fresh snow. Owing to the low camps the trips are all very long and one must sit out some nights on the rocks. The weather at our camp was good, but stormy most of the time on the peaks, with much drifting new snow. As usual, as soon as provisions became short it cleared up. Our time was thus necessarily, and, perhaps, as profitably spent in exploring passes and routes for next year's work.

The names in this region have not yet been passed upon by the Geographic Board.

TWO CLIMBS IN THE TORNGATS

By A. P. Coleman

In spite of gales and floating ice, the Gerfalcon had winged her way for 900 miles from Newfoundland to the Torngats in northern Labrador, and now we anchored at the Schooner Cove in Nakvak Fiord. The little 17-foot punt was hoisted out and Alf and Uncle Lige, my two fishermen, loaded her with supplies and put up the tiny brown sail, and we were off for the end of the fiord thirty miles away. It was a sheltered waterway only a mile and a half wide and walled in by mountains, yet we were halted twice by storms too fierce to pull against. The last delay, in a little harbor with a sandbeach, I did not much regret, since our camp ground was at an old Eskimo village, in summer vacant, in winter tenanted by just two families at present. We had met them at the Schooner Cove huddled in two small tents made of blankets.

These winter residences are not aspiring. They are really burrows in the sandy soil; each with a dormer window, glazed with seal intestine, projecting above the turf, and the odors savor so pungently of the seal blubber burned in the soapstone lamps lying on the floor that my visit did not last long. The village, without a bush in sight and with huge whitening bones of the whale, the walrus and the seal littered about, was as unlike an Indian camp ground in the Rockies as one could imagine; for here everything was adjusted to the kayak, the monsters of the sea and a nine months winter, instead of the pony and the bighorn and the summer sun of Alberta.

Nakvak Fiord is the most wonderful inlet of the sea on the eastern shore of America and reaches a climax at the very end, where cliffs of ruddy gneiss rise 3,000 feet or in one place even 4,000 feet above the tide. Here on the

bare gravel of the river delta, under the shadow of the cliffs, we hoisted the old silk tent in so furious a Chinook that a guy had to be fastened to westward to keep it from blowing away. Now for a walk up the valley to spy out the land and have a look at the mountains!

A long mile over loose stones brought me to a mountain-walled lake, even grimmer than Devil's Lake near Banff. By the way, why did they change that eminently fitting name for the sugary and inappropriate Minnewanka?

To the south of the lake opened a rough and steep valley with a snowy mountain in the distance and, nearer by, a daring pinnacle of brown rock about 4,000 feet high with a cloud banner streaming from its summit in the west wind. After two fordings of the wild creek in the canyon at the foot of the peak and much rocky scrambling, no way of scaling the walls of the valley presented itself and I went back to camp. Some of our adventurous younger men with a proper love for chimneys and gendarmes may perhaps climb this miniature Matterhorn in some later summer.

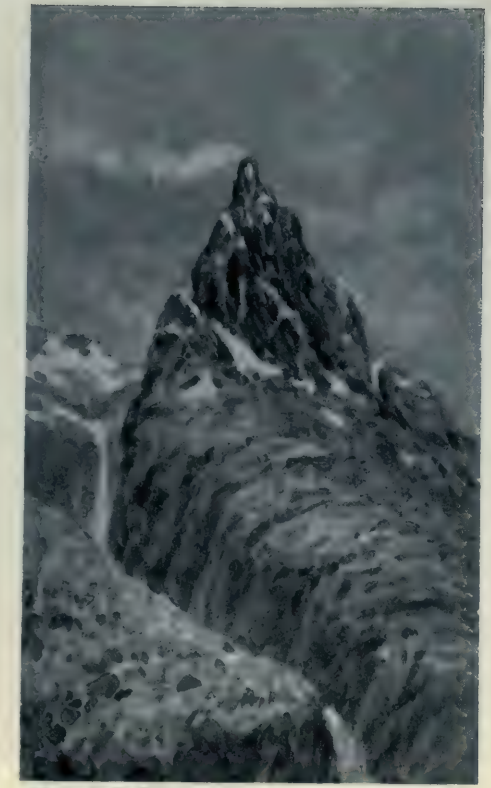
At the tent I found that the question of firewood was agitating Alf, who looked after our meagre cooking; so we had a strenuous pull in the boat across the powerful current of the river to reach a forest on the sunny northern side of the valley. Here willows and alders aspired to heights of six or even eight feet, the rankest growth of timber in the region, and we presently gathered all the dead wood needed. Next day our woodpile served us well when fog and rain drove in from the east, bringing the chill breath of the Arctic current.

On the third day the sun shone fitfully and, for a wonder, the fiord was unruffled so that the walls of rock were doubled by reflection. The punt was drawn in from its anchorage and we embarked and rowed two or three miles back to a valley promising an easier climb than the mountain walls round our camp ground.

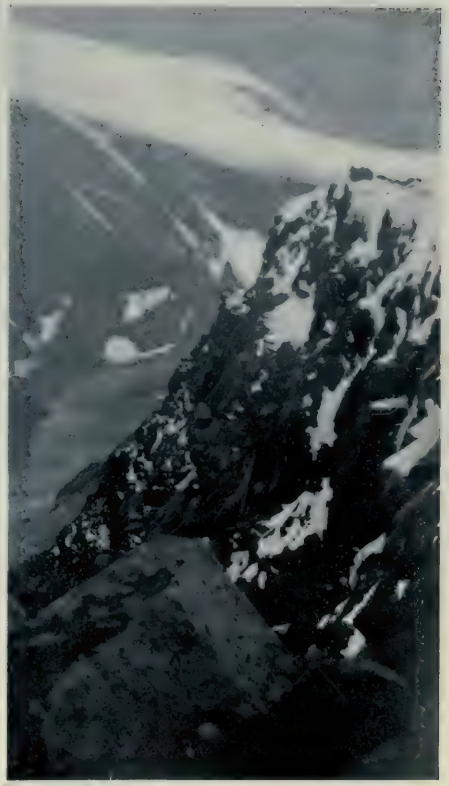
The valley, with its stony floor carpeted with trailing bushes or wild flowers, reminded one of the slopes of the Rockies above timberline, and the beds of white heather (*Cassiope tetragona*) and bunches of moss pink (*Silene acaulis*) seemed quite homelike to an old tramper of the western mountains. At 900 feet, where the last dead twigs made the boiling of a kettle possible, we made tea and had a second breakfast. The Newfoundland fisherman is as dependent on his cup of tea as an Australian bushman or an English society lady, and he wants it well boiled.

Then came steeper slopes of rough loose stones and sometimes a bit of cliff, and the plants dwindled to brown moss and the reindeer lichen. At 3,000 feet a cirque with a lake and some snowbanks, a thousand feet below, suddenly yawned before us and we zig-zagged southwards to get an easier grade. At 3,500 feet the rockwork became difficult, though not dangerous since it was good solid gneiss, and my two fishermen began to lag and to enquire whether "us ought to go any farder." However, they were encouraged and went on and when a final cliff of shattered gneiss was mastered, at about 4,000 feet, we stood triumphantly on the summit expecting to look over towards the wild valley I had seen two days before. Instead, we found a gently rolling surface sinking westwards for a quarter of a mile and then rising as a slope of snow endlessly into the sky. Snow in August seemed ominous and fearsome to my men, but the mountain rim beyond was irresistible to me and when I started on, as decent fellows, they followed. At the foot of the snow-slope was one of those intense blue little lakes, still half frozen, that you remember on some of your climbs, and just to the south a brook leaped into space.

The snow-slope was just right, as good as a sidewalk, lying at an average angle of only thirty degrees, and a mile of steady trudging, partly under dazzling sunshine



Photo, A. P. Coleman
PEAK NEAR HEAD OF NAKVAK FIORD



Photo, A. P. Coleman
LOOKING INTO VALLEY FROM TOP OF MT. SILENE

and partly under cloud shadows, brought us to the edge, where gray gneiss once more stood above the snow and a deep valley opened before us. This was the final summit of Mt. Silene, as I have named it from the pretty flower blooming high up on its flanks. The aneroids made it just 5,000 feet above the fiord, of which we could only catch glimpses because of a lower swell to the north.

The clouds had gathered and the ridge was chilly, so, after the men had built an inartistic cairn and I had shiveringly made some topographic sketches, we partly ran and partly glissaded down the snow-slope and then toiled up the loose stones of the northern swell of the mountain. This broke off quite as suddenly and threateningly as the main summit, and at my feet, but not at my men's feet, for they kept carefully away from the edge, opened one of the grandest views in eastern America.

The little tent could be seen away beneath, like a white boulder beside the silky blue-green river, and beyond to the west was a long, narrow lake with walls three thousand feet high and a roof of clouds. To the east stretched the blue fiord, its whole thirty miles distinct, partly in sun and partly in shade, and beyond its grand portals was the shimmering sea with a stately procession of icebergs slowly marching southwards. Inland rose higher mountains, mostly dome-like and partly snow-covered, a region not visited even by the Eskimo except in some of the wider valleys, the dwelling of the bad spirits from which the name Torngat comes. Clouds brooded over the unknown interior, with here and there an opening for shafts of sunshine to light up a snowfield or a bit of cliff among the blue and gray mountain masses. It was a fascinating scene and I hated to turn back, but it was now five o'clock and the ochre-colored cliff across the fiord a mile away was getting into shadow. Besides, we were desperately hungry and dry ship's biscuit could not be eaten without a drink.

Turning back over the rolling, stony plain, it was hard

to believe that cliffs cut off the square mile of mountain top to north and west and south.

Mt. Silene is simply a fragment of tableland isolated by the carving of profound valleys on all sides by glaciers during the Ice Age.

We made what speed we could to the eastern edge where we had come up, took a short cut along bad cliffs and slopes of sliding rocks beside the cirque, thereby losing time and temper, got a glorious drink and munched biscuits when we reached the creek, stumbled over sharp-cornered stones on the last slope, and at half past seven reached the sea pretty well done out, since fifteen days on the crowded Gerfalcon had not put us in training. And then came a bad fright. What had become of the boat? We had left it moored to a rock with an anchor out astern, but no punt could be seen bobbing on the waves. Visions of three famished men toiling thirty miles over the mountains with nothing to eat and then firing guns to bring a rescuing motor boat from one of the schooners passed before our minds, but at length we found the punt high and dry behind a great rock. All that had happened was that the tide had gone out.

With much tugging, the boat was got into the water and half an hour later in the dusk a fire was blazing beside the tent and we were gorging on Australian rabbit, biscuit and jam while the tea was getting boiled, and my men were boasting in a dialect half Irish and half Devonshire of their daring deeds as mountain climbers. They were by no means as modest or reticent as my two Eskimos, Cornelius and Johannes, the summer before.

A few weeks later, after various tramps and adventures in valleys or on mountains, one of 5,200 feet, we returned to the Schooner Cove, took on board the remainder of our supplies from the Gerfalcon and left Nakvak Fiord, turning the prow of the punt southward into the open sea. For some hours we rowed or sailed past the roaring foot of splendid cliffs, ascending and descending the long

Atlantic swells, and then, rounding Gulch Cape, slipped into the sheltered waters again. Here we shot a small walrus, innocently basking in the sun on a sloping rock and took its skin to be dressed by an Eskimo lady at the deserted Moravian mission of Ramah on Nullataktok Bay. The patriarch of the little community spoke a few words of English and explained that our victim was a "pickaninny woman walrus."

At the end of the fiord, for a day or two, there were minor scrambles to select the best routes, work done by Alf and myself, since "rheumatics" and other ailments kept Uncle Lige a prisoner, limiting his activities to shooting ducks on a nearby pond and having supper ready when we came home late and hungry.

A start was made for the mountain chosen, but we were driven back by rain, and then came a Sunday, fine but useless where pious Newfoundlanders are concerned. It began to look as if I should have to turn homewards with no more climbing, for it was near the end of August, and September storms do not promise good navigation for punts on the Labrador coast.

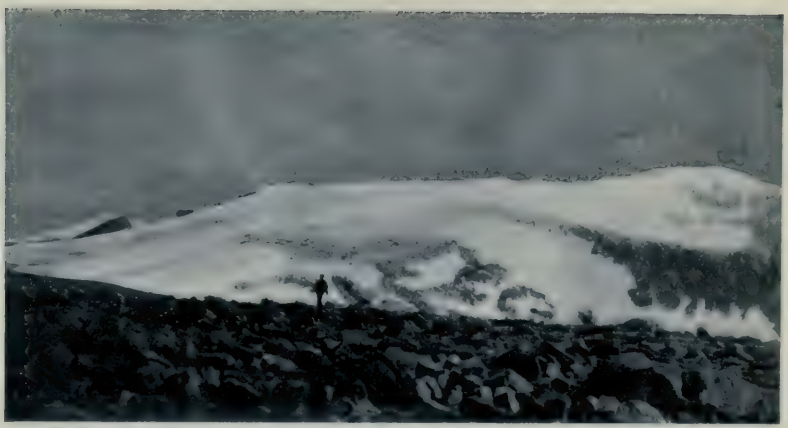
Monday, August 28th, was the last day possible, and it dawned threateningly with steel gray clouds and a streak of savage red over the sea, but Alf and I started briskly up the valley for our last climb, crushing under foot the low-growing blueberries and cranberries. Four miles up we left the main river to follow a torrent coming in from the north and tumbling over ledges of gneiss for a thousand feet. Beyond this was the usual deep valley, floored with huge blocks and enclosing a lake. Here a heavy shower sent us to shelter under a twenty-foot mass of gneiss, but was soon over. Then came a stiff scramble up a cliff, close to the torrent and slippery with moisture, to the rim of the next basin, 2,600 feet above sea, a typical cirque, verdureless with a dark lake hemmed in by snowbanks and big gneiss boulders rolled from the walls around.

It seemed possible to get up beside the waterfall to the next step in the gigantic stairway, but the walls beyond seemed even more hopeless than those around us. A backward look from the head of the lake showed a dip in the wall toward the southwest and we painfully made our way over almost unmanageable talus masses to the foot of a rock couloir, where we took a second breakfast beside a trickle of water from a snowbank.

A heartbreaking climb over stones that slid downwards almost as fast as we went up brought us to the col, at 4,000 feet, and we found ourselves once more on a fragment of the ancient tableland with firm ground beneath our feet. Northwards the mountain rose steadily with a sweep of snow against the sky that might be a mile or five miles away for lack of anything to compare with. A half mile brought us up standing at the edge of a chasm gnawed into the mountain from a valley to the west, and here we swerved eastwards. Much of the slope was wonderfully paved with angular blocks of all sizes wedged firmly together. Then came the snowfield, partly new and white, partly delicate blue-gray and made of ice-grains the size of hazel nuts, evidently permanent, for this was the 28th of August at the end of the hottest summer on record among the fishermen. It was impossible to judge on this elusive surface under a pale, gray sky out of which a flurry of snow came at times.

The snowfield ended and we walked on firmly wedged rocks again, always ascending, until, without warning, an abyss opened before us and I looked down upon a glacier, a stream and two richly colored lakes in a setting of dark gneiss. Beyond them, hardly a mile away, rose the grand cliffs and daring knife-edged ridge of Mt. Cladonia which I had climbed with Cornelius a year before.

The highest point proved to be a dome of snow, 5,520 feet above the sea by the best aneroid and thirty feet less by the other, and one could look over Mt. Cladonia, 500



Photo, A. P. Coleman

THE SNOWFIELD, MT. SILENE

Photo, A. P. Coleman

TOP OF MT. SILENE WITH HIGH SUMMIT BEYOND THE VALLEY

feet lower, and catch glimpses of Nakvak Fiord. A few summits to the west rose to our height and perhaps a little more, but none seemed to reach 6,000 feet.

With the nearest stones I built a modest "stone man," since Alf had sprained his right arm on his way up to the col and could not perform his usual duty.

We had reached the climax but walked east along the cliff edge to look down on another small glacier in a steep walled cirque before turning back. From Mt Cladonia I had seen still a third glacier in a third cirque the summer before, so that the name Cirque Mountain may be appropriately given to our highest summit.

It was after five and there were ten strenuous miles of travel as well as three ticklish descents before we could reach home, so we set out on the run down the snowfields, taking a little more care on the stony slopes, until the col was reached. From this to the lake, 1,400 feet below, was over the big and little rocks of the couloir, most of them ready to roll when touched with the foot, and meant a slow and painful grind, particularly for Alf with his almost useless right arm; so we halted and ate the residue of our lunch at the outlet where the waters were launched over the precipice into the next valley. The cliff and the talus below had to be taken circumspectly and the same was true for the last plunge of 1,000 feet from the hanging valley down to the main valley. It was dusk when the descent was finished and we had to wallow through bushes breast high for half a mile along the edge of the torrent before reaching the dry benches and swampy intervals along the main river. Meanwhile we could hear the minute guns fired by Uncle Lige to hasten us home. It grew dark and a shower soaked us to the skin before we jumped the final creek, paused at the camp fire and stooped to enter the little tent. The duck was stewed all to pieces and the tea boiled black; but by candle-light we filled the void satisfactorily and then lost no time in getting into our sleeping bags.

The summer of 1916 had gone fairly well in spite of rains and gales and unenterprising assistants. Three points over 5,000 feet had been climbed, while the highest ascended the year before had just touched that level. Some hundreds of square miles of unknown mountains had been roughly mapped and a few small glaciers had been added to those found in 1915, and now the summer was over.

Next morning the punt was loaded early so as to get off with the tide and a few hours later we turned "up south" over the big Atlantic swells with the roar of the surf in our ears along the foot of the gray cliffs.

CLIMBS AND EXPLORATIONS IN THE PURCELL RANGE IN 1916

By W. E. Stone

(Second article)*

The last days of July, 1916, found us busy in preparation for another campaign in the Purcells. As on the previous year, the rendezvous was at Karmax Ranch and the leading spirits the indefatigable MacCarthys. The field of effort was to be on Toby Creek and its northern branches; the purpose to connect up with the headwaters of Horse Thief Creek and its southern branches, as well as to reach some entirely new country to the westward. Toby Creek is one of the largest tributaries of the Upper Columbia River, having its source in the Toby Glacier near Wells Pass, some thirty or forty miles southwesterly from Lake Windermere and midway between the Columbia River and the Kootenay Lakes. Between it and Horse Thief Creek on the north lie some of the highest altitudes of the Purcell Range, while further to the west, between the headwaters of Hamill and Glacier Creeks, is found an equally interesting and wholly unexplored alpine region.

An old Indian trail followed the course of Toby Creek long before the white man's advent, and this route still constitutes the only practicable crossing of the divide for a distance of nearly one hundred and fifty miles between the main line of the C.P.R. on the north and the Crowsnest branch on the south. For some miles west of the Columbia Valley this trail has been converted into a wagon road for the accommodation of various mining and lumbering enterprises; but the unusual spring floods of 1916 had done such havoc with bridges and roadbed that this route had become impassable for anything less

*See previous article The Canadian Alpine Journal, 1916, p. 12; also Appalachia, Dec., 1916, p. 19.

mobile than pack ponies, and more than once during our progress we were forced to abandon the main trail and seek the old Indian route skirting the higher benches of the valley on the north side.

On the morning of Friday, July 28th, low hanging clouds hid the grey walls of the Rocky Mountain ranges to the east of the Columbia Valley, a weather portent none too assuring, but our brave cavalcade of ponies and the two farm wagons which were to give us a kindly "lift," set forth and for more than three weeks the skies were hidden by nothing worse than passing squalls. The expedition was provisioned for twelve days but the lure of unexplored valleys and virgin peaks proved stronger than any other consideration, and our stay was prolonged for twice that time, thanks to an unimpaired line of commissary communication with the supply base. We soon left behind the delectable gardens of the ranch and the few scattered cottages at the mouth of the valley. Across Lake Lillian the distant view of Nelson's bold peak gave us an anticipatory thrill. Just beyond Jack Pine, in place of the expected bridge, was a desperate gap of rushing water and far strewn boulders. The wagons which had accompanied us thus far, were now abandoned and with them disappeared the last trace of civilized ease and comfort. Packs were shouldered and, following the reluctant cayuses, we moved steadily on over occasional stretches of good trail alternating with jungles of brush and fallen timber. Plodding along at the rear of the column, we discovered one of the ponies foundered in a hidden gully in a dense thicket of alders. Lying on his back with all four feet in the air and four plump and precious dunnage bags for a mattress, he unconcernedly browsed upon such vegetation as could be reached from his somewhat restricted position, looking the embodiment of resignation and repose. What mattered for him the long trail or the burden of the day in the discovery of the real use of his

pack! He might be soldiering there to this day but for the recall of Bill, who, with a few meaningful words, destroyed his illusions and set him again in motion.

Camp No. 1 was pitched that evening at a division of the trail near the junction of the North Fork with the main stream of Toby Creek. On the following morning, having cached a portion of our supplies for the return, we took the trail up the valley of the North Fork and by noon had reached its terminus and established Camp No. 2 near a mine, where we remained four days amid the most picturesque surroundings. The head of the valley is entirely enclosed on three sides by altitudes ranging from eight to ten thousand feet. On the west a bold ridge, broken into four toothed peaks, was flanked by a considerable glacier. On the east high grassy slopes gave excellent pasturage to the ponies. Flowers and birds were unusually abundant in this sheltered situation, and we were particularly entertained by a family of loquacious wrens who never ceased to discuss their strange visitors during the daylight hours. A fine waterfall came tumbling over the terrace at the northeast and, breaking into a foaming cascade, filled the amphitheatre with the ever-welcome music of dancing waters. The range of rocky peaks to the west immediately attracted our attention, promising not only some interesting climbing, but from their commanding position seeming likely to afford a comprehensive view of the region to the west.

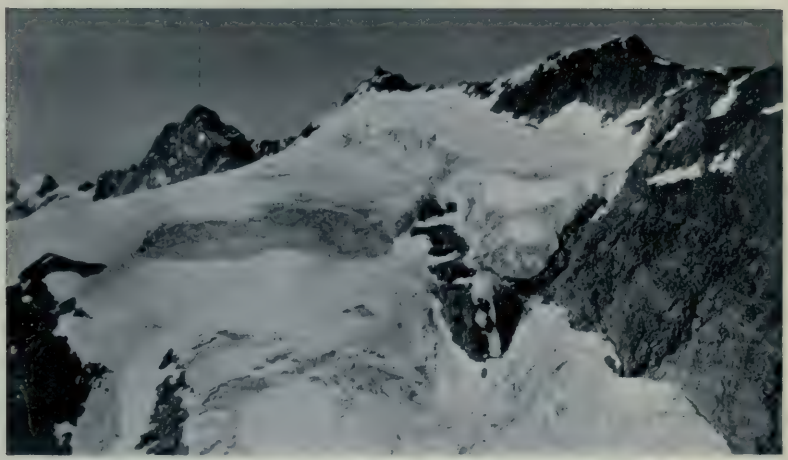
Early the following day, the 30th, we set out at 5.30 a.m., following an indistinct trail up the northeast side of the valley past the falls, crossing the stream on a snow-bridge among scattered larches, swinging around across a high terrace with snowbanks toward the west and up to the top of the first and lesser of the four outstanding peaks of the range, reaching the summit at 9 o'clock. As we came into full view of the surrounding country, we were delighted to find close at hand to the

northwest the Jumbo and Commander ranges and, for the first time, we saw the south face of Jumbo, a tremendous cliff of bare rock overhung by a beautiful snow-cornice. To the northeast Peacock, Spearhead and the Delphine Ridge brought vividly to mind the strenuous day spent on their pinnacles and chimneys last year. Most interesting of all was to recognize at the southwest foot of Spearhead our Shamrock Lake still covered with ice as when we last saw it, and to verify our earlier conjecture that it was the source of the North Fork of Toby Creek.* We could now plainly trace the course of the creek at our feet, up the cascade and fall to the icy bosom of this lonely, frozen lakelet.

The real work of the day now lay before us along the narrow and much broken ridge to the southwest, the successive peaks rising each a little higher as if to lead us in easy stages to their conquest. One hour sufficed to cross the first saddle and reach the top of Peak No. 2 at 10.25, the aneroid reading 9,025 feet. Nowhere did we find any evidence of former ascents, and the four peaks which we traversed in succession during the day were evidently virgin ground. In another hour we had crossed the next gap to the summit of Peak No. 3, with an altitude of 9,375 feet. Here we built a cairn and left a record of the names of Mr. and Mrs. MacCarthy, W. E. Stone and Conrad Kain. The day was clear and mild, and afforded us an uninterrupted view in all directions. Just at our feet on the west lay the valley of Jumbo Fork of Toby Creek, beyond which we had excellent views of several conspicuous high peaks which later we came to know in detail. Between the main Toby Creek and Jumbo Fork is a broken range presenting toward the east a series of sharp peaks and great precipices which, as we saw them in the noonday sun, had a peculiar glistening appearance and for which we conceived the name of "The Shining Range." As we proceeded to

*Canadian Alpine Journal, 1916, p. 30.

Monument Peak



Photo, W. E. Stone

RANGE WEST OF NORTH FORK OF TOBY CREEK

Redtop

Photo, W. E. Stone

THE SHINING RANGE

Looking Southwest from Monument Peak

descend into the next gap and ascend on the south side to the last and highest peak of the range, we encountered increasing difficulties. A very narrow and broken ridge led steeply up to a sharp conical cap, which on the east broke away very steeply for some two thousand feet to the glacier below and on the other side, so far as we could see, was surrounded at the base by a nearly vertical cliff. Ascending by the northeast arête, we soon came to an impassable situation but, traversing toward the west, discovered a chimney on the north face of the cliff which offered hope and, after scrambling up some distance into a narrow cleft, there remained a dozen yards of a crack just wide enough to permit the insertion of an arm and leg. By dint of vigorous squirming, we accomplished this and came out on to the sky line, from which a few steps brought us to the summit at 3.15 p.m., the barometer indicating 10,025 feet. The name of Monument Peak has previously been assigned to this point and the altitude given on the authority of the Geological Survey as 10,050 feet. Our ascent was evidently the first to be made. We erected a cairn and left a record similar to that on the summit of No. 3.

Careless of the flight of time in enjoyment of the view and a balmy temperature, and expecting an easy traverse and completion of the day's work, it was not until 4.30 that we made ready for the descent. To our surprise we found that the way was cut off to the south and there remained the alternatives of retracing our day's route which had already occupied eleven hours, or to find some other, more direct way to the valley and our camp. After a reconnaissance, Conrad declared, "It is all right," with that peculiar inflection indicating a state of conflict between his thoughts and his words. It was decided to attempt the descent down the east face of the mountain to the glacier. We had observed this side of the mountain during the day with no thought that it was practicable or that we should be called upon to attempt

it. From the edge of the cliff, one could toss a stone clear of the rocks and see it fall upon the glacier two thousand feet below. To this had the pleasant sport of the day brought us; this breakneck, desperate choice, suddenly confronting us out of the happy vision of a careless and early return to the comforts of the camp. The task before us seemed formidable enough in the prospect; its realization was nothing less; clinging to smooth slabs, squeezing down narrow cracks, dodging falling stones, traversing to right and to left, using every art to defy the law of gravity, it required five hours of the most careful work before we set foot on the ice below and were able in some degree to relax the tension of our minds and muscles. Twilight was already fast merging into darkness. We were at the head of a glacier where no human foot had trod, and for an hour in the semi-darkness threaded our way among crevasses and over icy slopes, happily without accident, reaching at last a steep rocky slide descending to the impenetrable darkness of the forest and valley. As long as we were upon the ice and snow, there was a certain faint reflection of light by which we were able to discern our footing; now we were forced to pick our way in darkness over loose and sliding rocks, and then through a thicket of scrub and fallen timber, constituting the most disagreeable if not dangerous experience of the day.

From the heights above we had observed an abandoned mining shack near the edge of timber and reasoned that there must exist a trail from this to the valley below. Just as it seemed as if we were doomed to struggle in the darkness all night, Conrad exclaimed, "A trail!" and we felt hard, smooth ground beneath our feet. It led us immediately into thick timber where the darkness was blacker than before, but with no serious difficulty we made our way until in the distance we caught the gleam of firelight among the trees and soon there burst upon our eyes the welcome sight of the large camp fire

kindled to welcome our return. It lacked but a few minutes of midnight, and after eighteen hours of effort, some of which had been sufficiently strenuous to satisfy the most enthusiastic members of the party, the savory mulligan and warm blankets were the complete satisfaction of every remaining earthly desire.

After a day's rest, we climbed (August 1st) the black rock-peak at the head of the valley to the north, ascending as before to the terrace above the waterfall, turning westward to the snow-pass north of Monument Range and then to the right up the arête. The southwest face of the peak is precipitous and in part overhanging, but by traversing to the left we found an open chimney and after a sharp scramble of a couple of hundred feet over very treacherous, rotten, black shale, came out on the summit in four hours from camp, the barometer indicating an altitude of 9,400 feet. The position of this peak is a commanding one at the focus of three valleys, the South Fork of Horse Thief Creek, the North Fork of Toby Creek and a branch of the Jumbo Fork of Toby Creek. As we lunched and basked in the warm sunlight the sound of the streams in all of these valleys came distinctly to our ears. Communication between these three valleys is possible on foot by crossing from the North Fork to the source of the branch of Jumbo Fork by the route we had followed to the snow-pass on Monument Ridge; then without descending, by skirting the west base of our peak a short distance, a second snow-pass is reached, from which the descent to the Horse Thief South Fork is easy. Both passes are of about the same altitude, approximately 8,000 feet. Almost directly westward Commander Peak and Glacier were in full view, while nearer at hand and almost at the foot of our position lay the glacier from which the South Fork of Horse Thief Creek takes its source. Far away to the north, beyond Horse Thief Creek, an imposing range of high peaks attracted our attention, and with

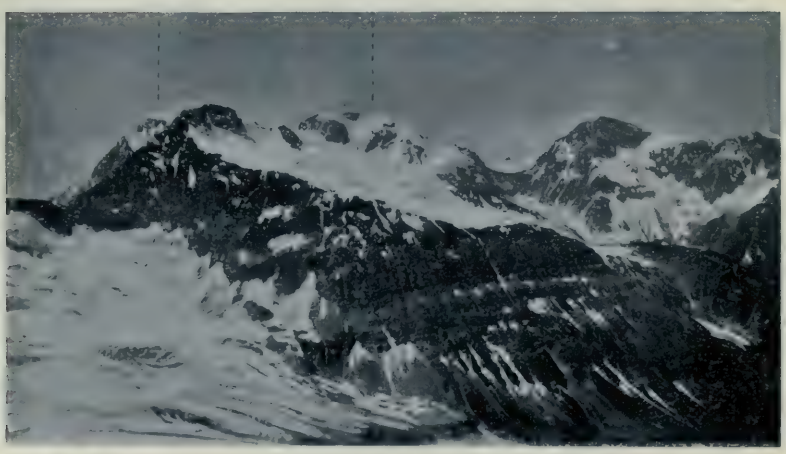
that delightful disregard of time and distance to which high altitudes tempt one, we naively pledged ourselves to their conquest some future day. The geological formation of this peak is distinctly different from the others in the vicinity, consisting of black friable shale, splitting freely into thin plates and crumbling to a powder. Its shape, color and location make of it a conspicuous landmark and excellent observation point. It seemed an excellent location for a coal mine and at least *we* thought the name of Black Diamond appropriate. We built a cairn and left in it a record of the ascent and the names of Mr. and Mrs. MacCarthy, Mr. and Mrs. W. E. Stone and Conrad Kain, and returned leisurely to camp, glissading down the snow banks on the south-easterly slope.

The ascent of Mt. Nelson from the North Fork basin is easily accomplished, and wishing to avail ourselves of the opportunity, we broke camp on the morning of August 2nd, and, descending the valley two or three miles to Nelson Creek, the first tributary of the North Fork above its mouth, turned up the trail leading to the northeast into a steep valley at the foot of Mt. Nelson. At the timber line we literally dug ourselves in on the steep side hill and established camp No. 3 at an altitude of nearly 7,000 feet. Late in the afternoon we were joined by Mrs. Vincent and Mr. John Vincent, who were none the less welcome because of the food supplies which they conveyed. A rainy night was followed by a day, August 3rd, of snow squalls and magnificent cloud effects on the heights. This did not deter us from an ascent of Mt. Nelson, in which nearly the whole party joined. The course lay up the valley to the source of Nelson Creek, across a small glacier and then on to the westerly arête which was followed to the summit. The party contained several novices, the rocks were powdered with fresh snow, and the day was boisterous and cold, but the whole number reached the summit without

Photo, W. E. Stone

MONUMENT PEAK
Looking Southeast

Jumbo Commander



Photo, W. E. Stone

LOOKING WEST FROM BLACK DIAMOND

difficulty about four hours from camp. Mt. Nelson, the easterly outpost of the Purcell Range, commands a splendid view of the Columbia River Valley and the Rocky Mountain Ranges to the eastward. On this day the scene was of unusual beauty under the shifting lights and shadows of the swift-flying clouds. We made but a brief stay on the summit owing to the weather conditions, rebuilding the shattered cairn left there by previous visitors, and leaving a record of the date (August 3rd) and the names of the entire party making the ascent, viz., A. H. MacCarthy, Mrs. Vincent, Mr. and Mrs. W. E. Stone, Elise Hopkins, Elinor Hopkins, Madeline Turner, John Vincent, and Conrad Kain, guide.

During the succeeding night the sky cleared and the temperature fell below freezing. Our morning sensations were of the magic transformation wrought by a white frost as the tardy sun shot his slanting rays over the eastern ridge, of the misery of morning ablutions, and of the general perversity of all the camp gear as with numb fingers we performed the routine of packing and moving. Conrad reminded us that it was the anniversary of the frigid night spent on Mt. Whitehorn in 1913 and at the vivid recollection my teeth chattered anew. At this rate, August 4th, may come to be characterized in our calendar not as a "red letter" day, but a day for red flannels. Having accomplished our mission on Mt. Nelson, we left for the main valley to continue our course up Toby Creek to Jumbo Fork. It was a day of varied experiences on the trail, in swamps, and through fallen timber. Late in the afternoon we arrived at Jumbo Fork coming in from the north to join Toby Creek. Leaving the main trail, we turned to the right and from the brow of a low hill enjoyed a fine view of the Jumbo Valley, its dark forests making an agreeable contrast with the desolate, burnt-over slopes which thus far had been encountered on Toby Creek. The Jumbo Fork is a beautiful, clear stream, skirting close to the steep slopes

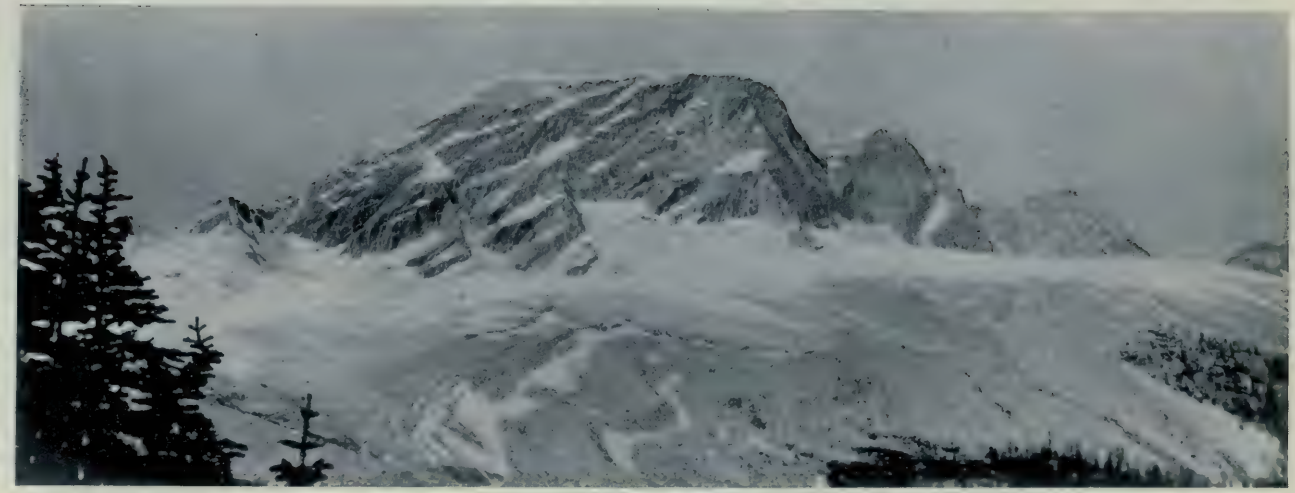
of the Shining Range on the south side of the valley. To the north the Jumbo massif was conspicuous and to the eastward Monument Peak was a prominent landmark. Far ahead through the vista of the enclosing ranges, unknown snow-peaks marked the region to which we were bound. Camp No. 4 (August 4th) was made in a clearing near an abandoned lumber camp, where we were especially grateful for the accommodations of the cook shack on account of a smart shower which surprised us before preparations for the night had been entirely completed.

Continuing up the valley on the following day, the trail crossed a timber slash and then for some miles followed the creek through beautiful forests, alternating here and there with "slides" in which the grass and herbaceous plants grew rankly, shoulder high. We observed flowers in great abundance which we had seen but sparingly or not at all elsewhere and were impressed by the fact that these narrow and isolated alpine valleys seem each to have its own characteristic flora. Indeed, it is quite conceivable that certain plant species, taking kindly to the peculiar exposure and soil of a certain valley, would flourish there exclusively, prevented from spreading to other nearby valleys by the impassable barrier of eternal snows. We noted, for instance, that the Devil's Club was not seen in any of the tributaries of Toby Creek on the eastern slope of the divide, but later, when we crossed Wells Pass, in an hour's descent on the western slope, we came into abundant thickets of this well known pest. In the high meadows bordering on Nelson Creek a species of larkspur occurred plentifully, which was not observed elsewhere. As we proceeded we had from time to time, through the deep, lateral canyons in the range to the south, views of distant snow peaks and recognized in them the high places of the Shining Range which had attracted our attention from Monument Peak.

Soon after noon we came to the forks of the stream, one the main stream coming from the north and the other, which we have named the South Branch, flowing out of the valley to the west and southwest. The bridge which had evidently at one time crossed the main branch had been swept away, and while the pack train essayed the dangerous crossing half under water, the ladies were forced to the ignominious expedient of "cooning" a convenient tree which had fallen athwart the tempestuous current. A hundred yards beyond, the trail crossed the South Branch but here a substantial bridge was still intact. Near by between the forks stands an old trapper's cabin, the roof sustaining a flourishing growth of vegetation. The trail now followed closely to the south or the right bank of the south branch of Jumbo Fork, gradually rising and bending to the southward and finally emerging from tall timber on to a rocky terrace which had evidently been swept many years ago by an avalanche, but now sustains a vigorous growth of young firs. This was a favorable camp ground except for the scanty feed for the horses and here, beside one of the many streams threading the valley, camp No. 5 (August 5th, altitude 6,225) was established for several days. Here the south branch of Jumbo Fork takes its source, the stream dividing itself into a dozen tributaries in a wide amphitheatre facing the north and east. The dominating feature of the scene was a bold rocky range on the west, consisting of three separate peaks rising from a high snow-plateau. Immediately below them at the head of our valley rested a broad glacier. To the north were a series of rocky points separated by green valleys, and to the south a long ridge dotted with snow-banks and culminating on the east in high, rocky ridges with another glacier lying beneath their northeasterly cliffs. A day was spent in establishing camp and in reconnoitering the surrounding region. An afternoon's jaunt (August 6th) up to the glacier at the west end of the valley revealed a magnificent view to the northeast,

bounded by the Jumbo Range, with glimpses of a splendid mountain country to the north and west. This region was wholly new, not even indicated on the maps, and apparently offering most attractive mountaineering excursions. During the afternoon our party was augmented by the arrival of H. O. Frind with a Shuswap retainer and a supply of food.

On the 7th, the day was spent in a traverse from south to north of the range to the west which, from the peculiar block-like conformation of its principal peak and the fact that it headed the valley, we named the Blockhead Range. Going up over the slopes to the southwest we were able to trace an old trail quite to the summit of the ridge and beyond, the route crossing a feasible pass over the divide to the headwaters of Hamill Creek. From this point we gained the first near view of Mt. Gleason and the magnificent snow clad range beyond Wells Pass. Following the ridge to the right we soon reached the foot of the first peak and, while resting before beginning the ascent, were greeted by the familiar squeak of a Pika hare or "haymaker." These little animals occur infrequently in this region, this being the only one observed during the entire summer. Of all the mountain dwellers this is the most humorous, interesting and charming, and one is always gladdened by his appearance. We had a most interesting rock scramble up the south arête of Mt. Blockhead over a confusion of rectangular, granitic blocks varied in one or two places by steep, smooth slabs over which water from melting snow trickled most treacherously. The summit was reached at 12 o'clock, four and three-quarter hours from camp. After lunch a cairn was erected and in it placed a record with the following names: Mr. and Mrs. A. H. MacCarthy, Mr. and Mrs. W. E. Stone, Mrs. G. E. Vincent, Elise Hopkins, John Vincent, H. O. Frind and Conrad Kain. The barometer indicated an altitude of 10,075 feet.



Photo, W. E. Stone

THE BLOCKHEAD RANGE
From the East

The range of which this was the culminating point, extends along the divide between the headwaters of Toby, Hamill, Glacier and Jumbo Creeks and the altitude afforded a far view in every direction. Easterly we could discern the peaks with which we had become so familiar, but to the north and west was an entirely new and strange scene. Hitherto entertaining the belief that the highest and most interesting mountains of the Purcell Range lay between Horse Thief and Toby Creeks, we now found it necessary to revise our impressions, for the splendid snow-clad range southwest of Wells Pass was equal in alpine quality to anything which we had seen in all this region. But the climax came when, turning toward the northwest, the eyes swept upward from gloomy canyons toward the varied features of a magnificnt massif, glaciers, vast snow fields and lofty heights and finally, as if irresistibly attracted, came to rest upon the apex of the range, a snow-white peak, immaculate and remote from all the world; an alpine spectacle as rare as beautiful. Silently we gazed on the wonderful scene and in the heart of each arose the determination to storm that alpine stronghold. This range is apparently that seen by Harnden from the summit of Mt. Monica in 1911 and referred to as the "West Kootenay Mountains."* The three peaks of the Blockhead Range emerge from an extensive névé which surrounds them on all sides. Between the first and second peaks rests a connecting arm of the glacier which drains toward Hamill Creek on the west and the south branch of Jumbo Fork on the east. At the foot of the second peak, we came upon an entirely different rock formation composed of strata of beautiful pink, white and green quartzite, collected in a great confusion of broken slabs and blocks at the edge of the glacier. The altitudes of this and of the third peak were not recorded, being somewhat lower than the main peak of the range but well above 9,000 feet. Curiously, the third peak

*Appalachia, April, 1912, p. 361.

consisted of a still different geological formation of rotten, laminated shale and we counted it noteworthy that these three peaks so closely connected should differ so widely in this respect. We descended with no little difficulty on the northwest ridge after having traversed the entire range. In this way we reached a saddle from which we could look down on the headwaters of the south branch of Glacier Creek flowing north and fed by the glaciers of the West Kootenay Range. All day we were conscious of this great range and the beautiful snow peak to the northwest and now took one last, fascinated look in its direction before descending into the valley and returning to camp for the night. Before darkness fell we had made our plans for an expedition to this newly discovered region on the morrow.

The distance was too great for a single day's effort and since the intervening range was impassable for the pack horses, we prepared necessary bedding and food, and at noonday (August 8th) set out, a party of seven, to establish a bivouac at the head of Glacier Creek. Following toward the northwest the bed of one of the tributaries of the South Branch filled with loose boulders and fed by many cascades from the high cliffs underlying the Blockhead Glacier, we came up into a trough-like green valley at the head of which the pass across the divide, covered with snowbanks, showed an altitude of about 8,000 feet. Descending on the northwest side through a steep, boulder-strewn region, we reached a little bench above the branch of Glacier Creek, where scattered clumps of fir provided an ideal place for a bivouac at an altitude of about 7,000 feet. A lively squall of snow and rain had dampened our clothing but nothing could quench our enthusiasm for the task ahead, although as night fell the low hanging clouds disappointingly prevented a view of the great glaciers which we knew lay on the opposite side of the valley. On this grassy slope and between the picturesque clumps of firs, white

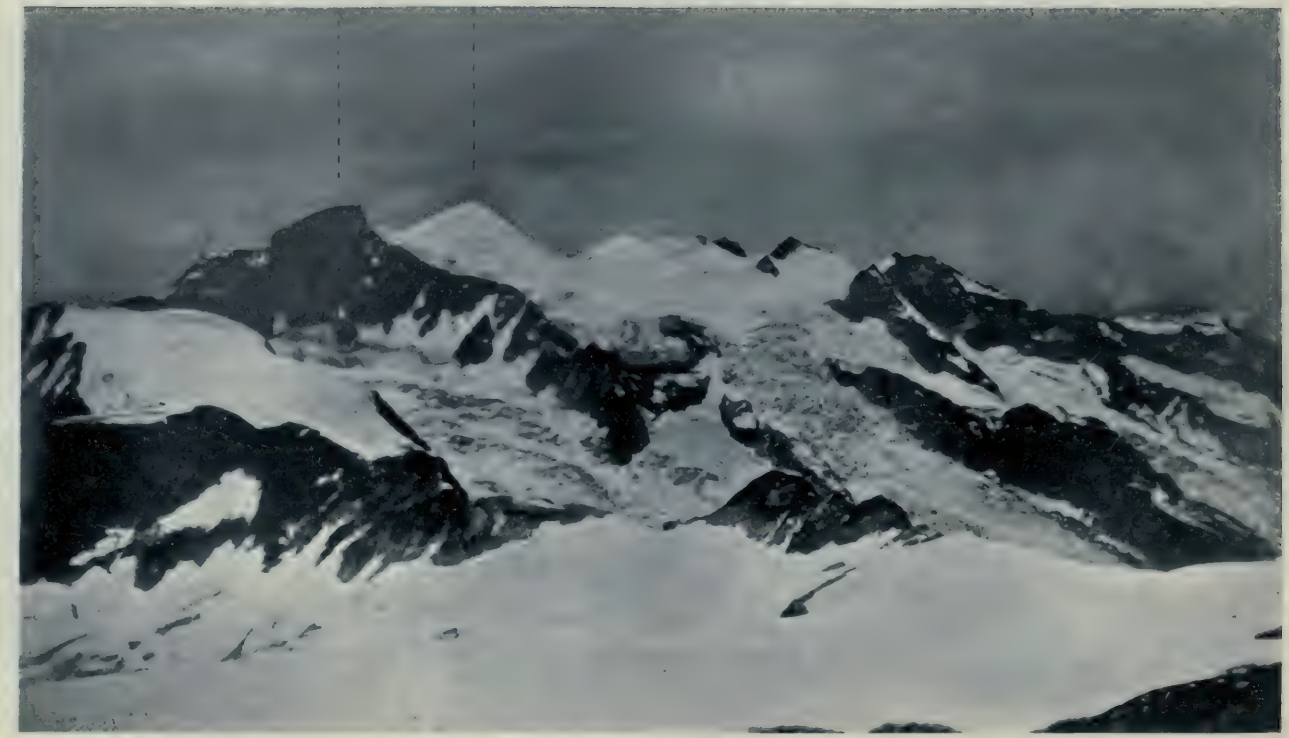
heather in dense masses was blossoming in all its fragrance and beauty. From far below came the roar of Glacier Creek and when we had built a fire, cooked supper, and prepared our sleeping bags under the shelter of the low-hanging boughs, the situation approached that ideal which the mountaineer cherishes in his imagination.

At daylight, August 9th, the call of "all hands" broke our slumbers and the preparation and consumption of breakfast occupied so little time that in the early morning we were skirting the north slope of the valley up to the tongue of the long glacier which descended on the southern limit of the range. We were soon on the ice and, making easy progress over its frozen surface, reached at 7.45 the foot of the bold projecting rock ridge which stands out like a cleaver between two immense ice-falls. As it proved, this was the only feasible route by which to ascend from the valley on to the névé at the head of the different glacier tongues which we had observed from below. The ridge narrowed, became more precipitous, and finally lost itself in an overhanging cornice of ice, through which we had to cut our way. When at 9.30 we emerged upon the great ice plain of the main glacier, we realized that nearly two hours had been consumed in what had at first seemed only an incident in the climb.

Meantime, the clouds had been gathering and thunder peals were reverberating from the great peaks on all sides. Suddenly, our ice axes began to hum with electrical discharges and then snow began to fall. We were enveloped in a strange greyish-white envelope blending with the snow, in which it was impossible to distinguish between earth and sky. For aught we could see, we might be either walking on this curious atmosphere or the snowfield might have enveloped us. The situation was interesting and novel but, more than this, it was dangerous in view of the raging storm and our

entire ignorance of our surroundings. Having taken bearings, however, before the clouds shut down and proceeding cautiously, we advanced up the glacier for more than an hour without incident. After a while the lifting clouds showed us an area of crevasses to the right and, while we sought to avoid them, presently the storm ceased; the misty envelope grew lighter and, suddenly, blue sky appeared above; and then, as if dramatically planned, the curtains were swept aside and there appeared before us our mountain quest, a splendid, imposing, snowy form resting on a snow-white plain. It was as if the battle of the elements halted at the appearance of this white flag of truce. Our anticipations which had been restrained by the clouds and the storm were now realized in one splendid transformation. The fresh snow had clothed the whole scene in whiteness such as I have never seen equalled. Right and left, sharp peaks of black rock stood guard around the central figure of this immaculate, beautiful mountain. Under the veil of the storm, we penetrated into a scene that impressed us as an alpine sanctuary, a spot where the foot of man had never trod and where the genii of the mountains must surely dwell.

The mountain itself displayed the symmetrical form of a tent with the long axis extending north and south. From our position we saw the long, eastern face. The summit ridge sloped gently toward the south, terminating at each end in steep descents to the surrounding snow-field. An hour had been spent in crossing the névé and now with clearing skies we were able to direct our course toward the north arête, the face directly before us offering no possibility of ascent. We found the north arête to consist of a narrow ridge of corniced snow not unlike some parts of the Victoria ridge and requiring the utmost care in choosing footsteps. A cold, biting wind pierced our clothing and swirled the drifting snow about us. We kicked deep steps into the soft snow, beating our hands for warmth and wondering in our



Photo, W. E. Stone

WEST KOOTENAY RANGE FROM MT. BLOCKHEAD

minds if the spirits of the mountains were again summoning the elements to defeat us in the ascent. A malicious gust snatched away a hat and dropped it on the edge of the bergschrund a thousand feet below. Slowly upward, step by step, we contested the way until at last the summit ridge could be seen through blinding snow-flurries. The MacCarthys were asked to take the lead for the honor of being the first at the top. Breaking through a last cornice, it was with an unusual feeling of awe and almost reverence that we gathered on the summit. This indeed was no ordinary ascent. Peaks by the score we had climbed but never before had we experienced such a feeling of penetrating to the holy of holies of the mountains where, remote and high, the alpine spirits held undisturbed sway. We felt as if some ceremonial should celebrate such an event; as if propitiation should be offered for our human intrusion; or sacrifice in token of our gratitude. In reality, such romantic ideas were speedily dispelled by the insistence of two very realistic bodily sensations of cold and hunger. So we made offerings to these on a patch of bare rocks on the western side of the ridge.

The time of our arrival was 11.10, the barometer reading 10.975 feet, although weather conditions may have had their effect upon the instruments. The mountain will undoubtedly rank in altitude among the highest of the Purcell Range. Commemorating the incident of our first complete view of the mountain, we chose the name Mt. Truce. To the westward, where we hoped to discover new sights, the view was obscured. Forty minutes was the limit of our endurance in the cold winds and clouds, and after erecting a cairn and leaving a record with the names of Mr. and Mrs. A. H. MacCarthy, Mr. and Mrs. W. E. Stone, H. O. Frind, John Vincent and Conrad Kain, we proceeded along the ridge, traversing the entire mountain from north to south, making an easy descent down the south arête and reach-

ing the snow-saddle intervening between us and the next peak at an altitude of 10,050 feet.

Without halting and taking advantage of a lull in the blustering weather, we started up the steep snow-ridge leading to the second peak to the south and, after about three-quarters of an hour of hard work battling with the rising wind and a sharp hailstorm, stood on the summit of the broken rocks of this second peak at one o'clock, the barometer reading 10,875 feet. Driven by the fierce winds, clouds swirled and boiled about the summit as from some volcanic pit, suggesting the name of Cauldron for the peak. The cold had now become severe. We were in danger of frostbites and were obliged constantly to beat our hands and rub our ears to prevent it. We stayed only long enough to build a small cairn and leave a record with the same names as on Mt. Truce. Mt. Cauldron terminates in a perpendicular cliff on the south, overhanging a long glacier lying in a trough between it and the Blockhead Range to the southeast. The northwest face offered a tempting glissade as the best method of descent to the glacier below, but scarcely had we started when smooth ice, covered with a sprinkling of fresh snow, was encountered and we shot down with more speed than grace. Fortunately, the ice extended only about 200 feet and, landing in soft snow, the anxious moment gave way to jokes and mutual recriminations. The storm now relented as if its final effort had been spent in driving us from the summit and the unobscured sun soon compelled the use of colored glasses. I have never seen such dazzling whiteness or blinding light. Returning across the snow-field, we reached the route of the ascent but the tracks were nearly obliterated with drifting snow. We found the way, however, without difficulty, back to the ice-fall and the one place where descent on to the rock-ridge was practicable. From this point the return was without incident and at four o'clock we had crossed the lower glacier to the moraine, after

having been on the ice and snow almost continuously for ten hours. The cache where our packs had been left was soon regained and there now remained the unromantic and toilsome climb over rocks and scree to the divide and the uninteresting descent along the stream through the timber to camp, where we arrived about seven o'clock, tired as only one can be after such a day's exertion and with the feeling of exaltation and pleasure which can only come from such an experience as we had enjoyed.

The following day might well have been observed in rest but from the high ridge to the southeast of camp came an invitation which could not be declined. A party of five spent the day in traversing the two summits, reaching an altitude of 9,825 feet. From the extreme point there stood revealed a fine, pointed peak of higher altitude, which seemed to terminate the range in the direction of the southeast, but it was too remote and difficult to be attained on this day which had been begun too late and used too leisurely. It was reached and climbed on the following day (August 11th) by Mr. and Mrs. MacCarthy and Conrad who reported an interesting ascent and an altitude of 10,325 feet. This peak is conspicuous for its red color and sharp, needle-like contour. It is probably the highest point in the so-called Shining Range between Jumbo Fork and Toby Creek. Harnden, who noticed it from Wells Pass in 1911, suggested the name of Needle Peak, but since this designation has been given already to several other mountains, it seems desirable to apply a more distinctive name for which we have selected that of Red-top.

On the evening of August 10th, the camp celebrated Conrad's birthday with appropriate impromptu ceremonies and eatables. On the morning of the 12th, having pretty thoroughly explored all of the region about us, the tents were struck and the party set out for the headwaters of the Main Branch of Jumbo Fork. Retracing our course along the South Branch to the forks of the

stream and crossing both streams, we found an indistinct trail on the east side of the valley, which we followed to the north. The ponies became involved in a labyrinth of fallen timber, the trail having been long unused. Lunch was eaten at the crossing of the stream and, having gotten over to the west side of the valley, good progress was made over a fairly good trail steadily ascending and evidently leading up to a low place in the ridge on the divide between Jumbo Fork and Glacier Creek. Convinced that this led us away from our destination, we picked up an old trail on the edge of a slide which brought us again into the valley and to the creek, and at five o'clock reached an open meadow and an ideal place for camp.

Among the varied experiences of mountain exploration, one of the most interesting is thus to penetrate into an unknown valley, to discover the source of a stream whose picturesque course has guided your footsteps for miles, and to survey the conformation of the vast amphitheatre in which mountains, glaciers, waterfalls and forests array themselves in new combinations. To arrive in such a spot means to achieve the end of the trail, the completion of a given task and the beginning of a new one. After the pitching of a camp with more or less thoroughness according to the length of stay contemplated, attention is turned to the surrounding peaks and for days one dwells on the summits of great mountains whence his physical and spiritual vision wanders far over the heights but returns with satisfaction to the upward curling smoke of the campfire and the white tents dotting the green valley far below. With such sensations, we established camp No. 6 in the most interesting and charming place in which our tents were pitched during the whole expedition. The open meadow (altitude 5,650) furnished an abundance of feed, a dry place for camping and numerous clear, cold streams for bathing and drinking. Along the western side a saw-toothed range

composed the skyline and marked the divide; to the north the valley lost itself in a high snow-covered ridge; and on the east, dominating all else, towered the pyramid-shaped, unclimbed and unnamed twin of Jumbo. This was the goal for which we were striving and which, after a day of exploration, we attained.

We awoke the next morning to find the scene whitened by a sharp frost and the still pools of water covered with ice. The first day (August 13th) was spent in exploring the head of the valley, which we reached through a mile or two of wet brush, and then ascended above the source of the stream upon a small glacier to the summit of the snow-pass. Here we came out on a broad snow-field, the southern source of the great Starbird Glacier beyond which Mt. Bruce rose in isolated majesty. Close at hand on the west, beautiful Mt. Monica displayed its white domes. Following up the ridge toward the east, we looked down almost perpendicularly upon Lake Maye, dotted with floating ice and bathing with its jade-colored waters the foot of Jumbo Glacier. Late one afternoon last year we had stood on the summit of Jumbo and, looking across the snow-field to the west to another snow-covered symmetrical peak, regretted that time would not allow an attempt to ascend it.* From our present position we saw an entirely different aspect of this imposing peak which we had come so far to attack from the western side. The high altitudes of Jumbo Glacier, resting on the east side of the mountain, detracts from its apparent height when seen from that side. But now we looked upon the westerly face of the peak rising abruptly from the floor of the valley more than 6,000 feet, a huge pyramid with sheer and almost perpendicular faces.

Skirting its lower slopes on our return to camp, we amused ourselves in stalking two goats who were feeding in a little gully. One of them becoming suspicious of our

*The Canadian Alpine Journal, 1916, p. 25.

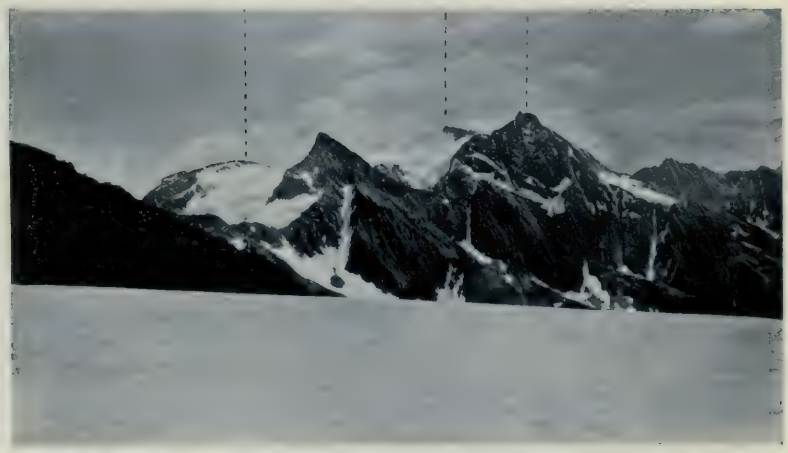
presence, took post on a projecting rock and, after a solemn survey of the surroundings, deliberately turned tail toward us and lay down in fancied security. An attempt to secure a photograph destroyed the charm and both animals went galloping over the ridge and, as we supposed, were lost to future view; but presently on a distant slope we saw them scrambling toward the skyline, having gathered to themselves other members of the family, numbering nine in all, including one or two kids. With that incredible ease which is the despair of the mountaineer, they had soon gained the crest of the ridge and disappeared from view, one dignified old billy lingering on the skyline to cast a final glance of contempt upon us.

We were now ready for the attempt upon the great westerly tower of the Jumbo Range and on the following morning (Aug. 14) set out in the early twilight, the whole route of the ascent rising directly before us. An hour's steady effort without rest brought us through the timber. At nine o'clock we were on the rocks and an hour later stood on the first bench or shoulder at the foot of the great central arête leading up to the final tower. Flanking this arête to the north, the whole mountain side was one smooth, steep slab, a terrifying prospect to the climber but which, fortunately, we were not called upon to essay. The rock was loose, sliding shale but, as we made our way upward, the anticipated difficulties of the ascent disappeared. Soon we were on the second bench and stopped for lunch and rest. At twelve o'clock we had reached the foot of the final tower which terminates the peak and gives character to its aspect. Stopping to examine the interesting chimneys into which the tower is cleft, we found that it was practicable to skirt the base on the south side and so come easily up into a snow-saddle just below the peak. As so often happens under such circumstances, as we approached the saddle, we came with a few steps abruptly

Photo, W. E. Stone

MT. TRUCE
Looking North from Mt. Cauldron

Commander Jumbo Karnak



Photo, W. E. Stone

JUMBO RANGE
Looking S. E. from Snowfield at Head of Jumbo Fork

face to face with the whole grand view to the eastward of the mountain. Before us lay spread Jumbo Glacier, flanked on the right with Jumbo Peak and in the distance with the long rounded ridge of Commander. A few minutes later, at 12.30, five and one-half hours from camp, we stood on the narrow, broken point of the summit where there was scarcely room for our party of five. The barometer indicated an altitude of 11,050 feet, confirming our belief that this summit was approximately the same height as Jumbo itself (11,125 feet). A cairn was built and in it placed the names of Mr. and Mrs. MacCarthy, Mr. and Mrs. W. E. Stone, and Conrad Kain.

As had so frequently occurred in other ascents of this season, we were favored with pleasant weather and a clear sky, which gave us a chance to photograph and take bearings on all of our recent acquaintances, Red-top, Blockhead, Truce and Cauldron, as well as to verify the new and often strange aspects of high altitudes in all directions. In every one of the ascents which we had made in this region, the beautiful range to the southwest beyond Wells Pass impressed us with its height and beauty and now we looked upon it again with keener interest since this was to be our next objective. Remaining until 2 p.m., we descended rapidly over the sliding slabs of shale to the third bench and then, turning to the right into a snow-filled couloir, enjoyed an almost uninterrupted glissade far below the timber-line, returning easily to camp at 4.15 in the afternoon. What had promised to be a climb of more than usual difficulty had been accomplished with average effort, although the height and position of the peak made this one of the most important ascents of the summer. Obviously, a mountain of such altitude and dignity can no longer be referred to as the twin of Jumbo. In seeking a suitable name, a fancied resemblance to something Egyptian in its characteristics makes appropriate the name of Karnak, which it was agreed should be bestowed upon it.

On the 15th of August, we were again on the march. As we broke camp at 8.30, too early for the morning sun to have penetrated over the high eastern wall of the valley, we could plainly discern the morning star glowing in the zenith. All day we plodded down the valley to the junction of Jumbo Fork with Toby Creek, where we regained the main Toby Trail late in the afternoon and turned westward up stream in the direction of Wells Pass. By nightfall we had reached Earl Grey cabin, a comfortable camp, where we bivouacked (No. 7). The position here is a commanding one for an outlook up and down the valley, but the destruction of green timber in every direction by fires and the lack of water make it a less attractive camp than many others. We were still a day's journey from our destination and the following day (Aug. 16) was spent on the trail. From time to time from midday on we caught glimpses of what is undoubtedly a fine waterfall on Toby Creek and a little after noonday stopped for lunch in a meadow not far from it, but the thick timber and its position in a considerable canyon prevented a closer view. Late in the afternoon we saw the source of Toby Creek, its copious waters gushing out from the tongue of Toby Glacier lying to the southward of Wells Pass. The trail leading up the pass zigzagged back and forth over steep flower-strewn, grassy slopes which, in bygone days, had doubtless met the pressure of the great glacier, at one time filling the head of the valley. Now its sheltered aspect, its beautiful flowers, and its vivid colors were all significant of the peaceful rather than the elemental side of nature.

We had planned to camp near the summit of the pass, but, when we had crossed over the ridge, encountered many snowbanks and no suitable stopping place. Led on by the hope that we should soon come to a rivulet of water and some more favorable camp ground, we kept on descending the trail, which followed an almost continuous grade towards the north upon the east side of

the valley, until nearly nightfall, by which time we had descended to the level of Hamill Creek, a distance of some two or three miles beyond the pass. All of the way our attention was riveted upon the magnificent range of mountains across the valley to the southwest, from which we were separated by a tremendous and apparently impassable gorge. While we realized that every step forward took us farther and farther from the head of the valley, across which lay our most practicable route to reach this range, we had really no choice but to seek a suitable camping place for the night and determine the most feasible point of approach to the mountains on the morrow. This range has been alluded to by Harnden and an excellent photograph, taken from Wells Pass, is to be found in Appalachia, April, 1912, p. 356, also Canadian Alpine Journal, 1912, p. 98. Ranging northwesterly from Mt. Gleason, which was ascended by Harnden in 1911, this splendid range culminates in three or four peaks, which doubtless approach 11,000 feet in altitude and from all appearances offer most interesting problems to the mountaineers who can succeed in placing foot upon their slopes.

When we had come to the crossing of the trail on Hamill Creek, we turned up the creek for a little distance seeking a suitable place for our camp (No. 8) and compromising finally on a sheltered spot in a thicket of alders, the gathering darkness leaving us none too much time to pitch the tents and prepare for the night. Luckily, this task was done with some thoroughness, for long before daybreak we were awakened by the sound of falling rain and for two days found ourselves storm bound. Conrad, going out the next day to reconnoitre up the valley, returned drenched and half frozen to report no feasible route to the mountains in that way. The valley was a jungle of dense alders. As was to be expected, on the western side of the divide the whole character of vegetation had changed. Devil's clubs,

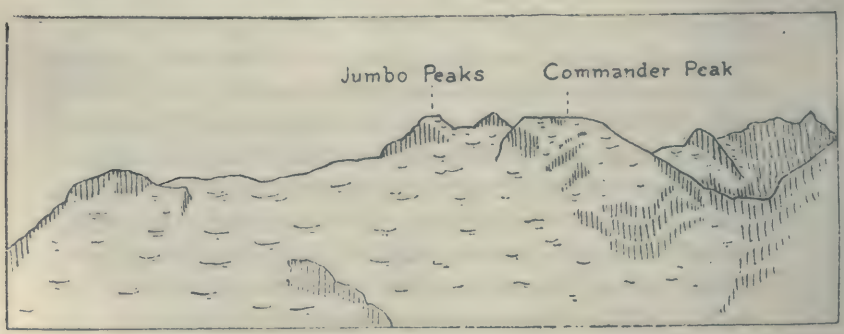
ferns, alders, cedars and all of the other usual varieties and kinds of impediments to progress were to be found here flourishing to the utmost. We now waited only a suitable change in the weather to permit a re-location of camp nearer Wells Pass and a more acceptable route to the great range which we wished to conquer. During the second night, however, the rain changed to snow and all the second day we could only chafe at the delay and expend our energies in keeping dry and comfortable. Trees and bushes were weighted down with their white burden. Dry firewood became scarce. All nature seemed dispirited. A little fledgling bird kept up its mournful cry in the thicket nearby and was later found frozen. Another curious little bird, with absurdly long legs and the appearance of a thrush, kept hopping about the tents and peering in as if he wished for company and comfort. Out on the sandy flats of the stream we noticed many bear tracks and it required no great stretch of the imagination to fancy what reprisals upon invaders might be attempted by the denizens of the valley.

The morning of the third day (Aug. 19) brought breaking clouds and we made haste to depart. Our knowledge of the valley consists of fleeting glimpses of black cliffs and high snow-slopes caught between the wreaths of rising mist and we turned back up the trail, ankle deep in soft snow, bitterly lamenting the conditions which had disappointed us. It soon became evident that our plans for climbing had been entirely upset for many days. The depth and extent of this summer snow, which had whitened the whole country far below the timber line, being quite exceptional and producing conditions upon the high summits which would render climbing quite impossible. This situation, as well as the depleted condition of the commissary, decided the question of an immediate return to the ranch. Regretfully, we gazed again to the cloud-swathed heights of which we had anticipated so much and then crossed the divide and

started on the return. Wells Pass commands an almost uninterrupted view of the Toby Valley as far as its confluence with the Columbia. As we saw it this morning, the scene was entirely transformed from that which we had viewed two days before. As far as the eye could reach, all of the lower mountains were white and the flower-strewn slope up which we had come with so much enthusiasm two days before was covered with melting snow. The change which we noted was curiously indicative of how closely in these alpine regions the loveliness and the cruelty of Nature are connected. Two days before we had greatly admired this unique and beautiful spot, little thinking that danger and disaster lurked so near. A word of caution had already been spoken to those who were descending the trail on foot, when one of the ponies, in turning a sharp corner, stepped off the trail on to the slippery grass and before he could recover his footing, found himself slipping swiftly down the slope and in an instant had disappeared over the cliff, below which lay the broken glacier. It was all over in less time than it takes to describe it but some time elapsed before two members of the party could reach the unfortunate animal and the report of a rifle told us of the stern necessity which had been thrust upon us. It was a swift and illuminating example of the ever constant presence of danger in the mountains and the particularly treacherous nature of such a combination of wet snow on a smooth, steep, grassy slope. Without further incident, we reached Earl Grey cabin that night (Camp No. 9) and by the next night made our last camp at Jack Pine. At midday on the 21st we were again enjoying the luxuries and delicacies of clean clothing and fresh vegetables at the ranch. Twenty-five days had elapsed since our departure, in which time we had travelled over the various trails about 150 miles; made ten camps; climbed thirteen peaks of from 9,000 to 11,000 feet altitude, of which twelve were first ascents, and six over 10,000 feet. and had located five passes, besides securing data for

many important additions to the map of the region between Toby, Horse Thief, Hamill and Glacier Creeks. In the two seasons, explorations of which this article records the final results, the topography of this region has been fairly well determined and, while its principal peaks have been visited, there still remains here much to be done in the way of further exploration and climbing.

In the 1916 number of the Canadian Alpine Journal, an error occurs in the designation of peaks shown in the plate facing page 22. Correct naming is indicated below.—Editor.



THE THIRD ASCENT OF PINNACLE MOUNTAIN*

By Louis S. Crosby

Most of my readers will remember well the excellent account of the first ascent of Pinnacle Mountain by J. W. A. Hickson in 1909 as recorded in volume two, number two, of this Journal. His article has always been an allurement to me and I was determined after attaining some experience to make an attempt on the peak from its southern slope and climb the chimney of fifty feet at the point where his party found it necessary to rope off. I was extremely fortunate in being able to secure the services of the same two guides who piloted Dr. Hickson safely to the top, namely, Rudolph Aemmer and Edward Feuz, Jr.

At five a.m. September 23rd we took a surrey for Moraine Lake, where we arrived shortly before seven; it was quite dark when we left but now the rays of the rising sun could be seen striking the tops of the Ten Peaks and Temple. With the exception of a few scattered cumulus clouds in the vicinity of Deltaform, the sky was clear and gave every appearance of remaining so for the next twenty-four hours. Feuz, however, had noted that on the previous day the barometer indicated a change and was of the opinion that our climb would be the last of the season in this region and doubtful if the weather would hold to make it. About a mile from the lake an old mother grizzly and her two cubs scampered across the road in front of us, not more than fifty yards away. When they considered themselves at a safe distance, they halted and perched upon some fallen timber, taking a good look at us before proceeding

*The second ascent was made by Mr. Allan Carpé, of New York, with the Swiss guide, Rudolph Aemmer, in August, 1916.

towards the Tower of Babel, where they probably were going to attend morning worship.

Moraine Lake can no longer be called an uninhabited spot, Miss Strick having established a permanent camp at the end of the tally-ho road, a few yards from the edge of the water. As none of the inmates were yet astir, we did not demand breakfast, simply put an end to their slumbers with a few war whoops, declaring who we were. A good pony trail now connects the tally-ho road with Larch Valley, which we reached easily by eight o'clock; here we stopped for a few minutes' rest and took a few snapshots of the Ten Peaks and Pinnacle—our quest—which now showed up splendidly in the morning sunlight. I must confess that from this point it does not look so difficult as it proved to be.

After proceeding up the trail which leads to Sentinel Pass a short distance, we branched off into the draw to the south which leads up to the saddle between Pinnacle and Eiffel. We halted for breakfast at 8.20 and twenty minutes more saw us ascending an easy snow-slope at the head of the draw. The snow carried up to an altitude of about seventy-eight hundred feet and another twelve feet of easy rock work, mingled with small patches of coarse shale, brought us to the saddle, where the real climb commences. When we reached it we were surprised to find that Ringrose, Hungabee and all the other mountains west of Paradise Valley were now veiled in mist, in fact, everything gave evidence of an approaching snowstorm. Determined to reach the top however, before conditions became impossible, we lost no time in traversing the arête to the right and up through the couloir to the first really difficult wall, which is probably four hundred feet from the saddle. Here we roped and, leaving our ice picks behind us, commenced scaling a practically perpendicular wall of some fifty or sixty feet, Aemmer leading, Feuz second and I in the rear. It was evident that only one man must move at a time if the

others were to be of any assistance should an accident occur. We were using a ninety-foot rope, so had thirty feet between us and when at closer intervals the slack was always taken up.

It appeared from down the couloir that this wall might be avoided by traversing a narrow ledge which led around to the right into a chimney, and after the guides debated the matter in their own language (much to my annoyance), I saw they intended to try it, for Rudolph set out gingerly along the ledge, kicking off, as he went, the small fragments of shale which had fallen down from the overhanging cliffs above. The thirty feet of rope was barely long enough to take him to a spot sufficiently large to secure a good footing, so Edward had to go along the ledge some distance to let Rudolph off at the other end. It was a nice piece of work and a slip on the part of either of the guides meant disaster to us all, for neither of them, with the meagre foothold and handhold they had, would have been able to hold the other, and while I was in a place of perfect safety, I would not have been able to take the weight of a fall of two men. However, nothing happened, but I was glad to hear Edward say "Come on," for I knew Rudolph had landed safely round the ledge into the chimney. It made little difference whether I fell off or not, for I knew my miserable little hundred and thirty-five pounds would have no effect upon a couple of "huskies" like these fellows, and though I might dangle down the side of the precipice, twenty feet or so, I knew they would soon pull me up. I made the grade, however, and the first thrill was over.

After working our way up the chimney a little way, another conversation took place equally as unintelligible to me as the last and when I heard Aemmer say "No good," I had vision of the ledge again. By the time we had explored the chimney and found it impossible to ascend and had traversed the ledge twice, we found

ourselves gazing up the slippery black wall once more, with half an hour of valuable time gone. There was nothing to do but get up, so very cautiously testing each hand and toe hold before placing his weight, Aemmer managed to make a tiny ledge twenty-five feet from the top. It was comparatively easy for Feuz and myself to reach this point with the assistance of the rope; the remaining twenty feet to the top of the wall was easier, and we soon found ourselves climbing over good rock for the next three hundred feet to the bottom of the chimney where Dr. Hickson and my two guides roped off eight years ago and which had proved too much for all previous expeditions. The altitude here is probably 9,750 feet, and we were now on the western face of the mountain, exposed to a strong wind, accompanied by light snow flurries.

As we sat down to take off our heavy climbing boots, I knew the real climb was on. Aemmer replaced his boots with light ones of his own construction, having twine soles; Feuz wore ordinary rubber-soled tennis shoes, while I surprised them by producing a pair of old felt boots, which I found to grip all conditions of rock splendidly, and which both guides agreed were well adapted for the purpose of climbing chimney and perpendicular rock faces.

Before starting again, we took a few minutes for lunch and, feeling quite refreshed, started up the chimney. To me it looked impossible, but for the greater part of the way the work mostly rested on the guides, who, with a knee in a small crack here and an elbow in another somewhere else, kept working up till they reached a small ledge just large enough to hold the three of us. I managed to reach the ledge without the assistance of the rope, but am doubtful if I would have tried to do so had I not been fastened to it.

From the ledge it was necessary to cross the chimney and the only hold was a crack eight inches wide, about

Photo, L. S. Crosby

FIRST ROCK WALL, PINNACLE MT.

six feet above the ledge on the opposite side. To reach this, it was necessary for Rudolph to get straight up on Edward's shoulders and reach out across the gap for the crack—so far so good. Rudolph, thinking he could scale the wall by the use of his left arm and left leg in the crack, took his weight off Edward and started to perform a new feat in the annals of mountain climbing. Had the crack been narrower, no doubt he would have succeeded, but the strain of holding one's whole body with the leg in a twisted position while the arm is raised a few inches, and then holding the arm in a similar position until the leg is raised a little, cannot be kept up very long. Unable to find a place in which to jam his leg or arm and take the weight, he finally reached a position where it was impossible to get either up or down, so I volunteered to stand on Edward's shoulders, and lean across the chimney so that Rudolph could get out of his precarious position and on to my shoulders.

It was necessary for me to assume a stooping position so that he could reach me, and when the full weight came upon me, I felt as if I could never straighten up with the load. To make matters worse, I could feel Edward trembling under the weight of the two of us, so, mustering all the strength I had, I slowly straightened up, in order that Rudolph could get a small hand-hold and take off a little weight. This hand-hold was not sufficient to pull up by, however, and it was only by crossing my arms over my head and thereby giving him an additional ten inches that he was able to secure a second hand-hold, by which he managed to pull himself up to the rock from where they had roped off on the first ascent. Rudolph soon fastened one of the ropes he had brought and lowered it to the ledge, which I managed to reach again without mishap. With one rope to climb up and another around the body held by Rudolph at the top, there was no further danger.

The only accident met with occurred when we were in

form of a human ladder across the chimney and Rudolph had only one hand-hold. A rock, about the size of one's head, came tumbling down the chimney at considerable speed. Rudolph saw it coming straight for him and shouted a warning, but we dare not move, and although he saw that it was going to strike his hand, he was afraid to move it for fear I could not bear his whole weight any longer, so he stood motionless and let it hit him square on the back of his hand. It took considerable of his skin down the mountain with it, but little things like that do not damp the spirits of the true mountaineer.

It was an easy scramble up the remaining two hundred and sixty feet to the top, which we reached at 1.10 p.m. We spent but a few minutes there, as the sky was now totally overcast and the ever-increasing wind began to drive the falling snow into our faces, making it anything but pleasant.

The guides had come prepared to spend some time in making the roping off places a little more secure and to leave two good stout ropes hanging on the mountain, one at the chimney near the top and the other over the wall near the saddle; the object being, that in future it would be less dangerous to climbing parties and possible to make the ascent accompanied by one guide in place of two as hitherto.

When we arrived at the narrow ledge just above the chimney, the guides went down about 20 feet to the rock to which they had fastened the roping-off-loop on the descent with Dr. Hickson. It is remarkable to note that this loop was in almost perfect condition after seven years' exposure and doubtless would have served the purpose for which it was first used for many more years. The guides, however, deemed it advisable to leave it more durable, so they proceeded to affix the twelve feet of half inch wire cable which they had brought for the purpose. Although the cable seemed to have a good hold round the rock, Edward thought it best to put in a spike,

so with drill and hammer set to work to make the hole. This was a very difficult task at first, as he was obliged to stand on a three-inch ledge and reach out the full length of his arm to the point where the spike was to go; when the hole reached a depth of an inch or so, it was easier, as the drill acted as a hand-hold. Rudolph relieved Edward when they thought the work was half done and it was here that the most amusing incident of the expedition occurred—at least for me. Rudolph was pounding away most energetically and had just remarked that he thought the hole was deep enough, when all of a sudden the top cracked off the rock to the depth of the hole—our neighborhood was no place for a minister's son, if he understood Swiss. I had a bird's-eye-view of the whole performance from the ledge upon which I had curled myself up to weather the storm while they did the work. Anger soon turned to mirth and we all had a hearty laugh.

Half an hour had been spent drilling this hole and the guides did not propose making a new one in rock which would split up like this, so chiselled out the grooves round the sides and back of the rock. The ends of the cable were now spliced together, hung over the rock into the grooves and secured by wooden wedges and small stones; the heavy rope we proposed leaving was now secured to the loop and thrown down along side of the chimney. I was anxious to take a photo of this spot, so went down first. With one rope to slide down and another around the waist, I experienced little difficulty reaching the ledge below. I found keeping the body rigid, placing the feet out against the walls, and maintaining a position at right angle to the mountain to be better than sliding down with legs twisted around the rope. In my opinion, the former position is less apt to result in marked knees, knuckles and elbows.

I am a little disappointed with the accompanying photo of the chimney, but the light was bad. It will

serve, however, to illustrate the character of the rock. Rudolph can be seen near the top, while Edward is about 30 feet from the bottom.

When all had come down safely, we unroped, donned our heavy climbing boots, coats, etc., and, after finishing our grub-stake, made off at a good pace for the saddle. We soon reached the rock wall and, after choosing a suitable rock from which to hang our other extra rope, we went through the performance of roping off in short order. The lower end was made fast to prevent fraying by tying to a wedge driven into a small crack. We picked up our ice axes, which on this climb were of no more use to us than as many walking sticks. The saddle was gained in a few minutes, and nothing remained but to run down the shale slope to the snow and then glissade to the valley.

We reached Moraine Lake just at 6 p.m. and were given a hearty welcome by the campers and, after partaking of some of the excellent supper, took our leave for Lake Louise in the carriage which had returned for us.

POSITION OF CLIMBERS IN CHIMNEY

Photo, L. S. Crosby

THE CHIMNEY, PINNACLE MT.

THE FIRST ASCENT OF MOUNT LOUIS

By A. H. MacCarthy

The scenery around Banff, as viewed from the car window, does not reveal to one the exceptionally fine rock climbs that are near at hand and easily accessible from the Alpine Club House as a base. It was not until after a visit to the Club encampment on Healy Creek in 1916 that I had an opportunity to make a trip into the Forty Mile Creek Region back of Mount Edith to see the two rock towers lying northwest of it.

In company with Dr. and Mrs. W. E. Stone, Mrs. MacCarthy and I left the Club House at 6 a.m. on July 19th, under the guidance of Conrad Kain, for a day's picnic "to view the scenery," as one of the party guardedly announced, for we had heard of the formidable character of these towers and, as it was early in the season and none of us felt in proper condition to hazard the strain of a first class climb, we were content to consider it simply a trip of exploration. However, the exhilaration of three hours in the saddle at a brisk pace over a good road and a fine trail, winding up through the pine and balsam to the summit of the pass between Mounts Edith and Norquay, and the first view of the towers so inspired us that we immediately decided that we must go to the base of Mount Louis, the first tower.

The formation of this tower is very interesting, for it consists of thick strata of red limestone on edge, the line of stratification running north and south, and on those sides the massif is grooved with many couloirs and chimneys; above the massif a final tower rises for about four hundred feet, consisting of great slabs somewhat separated from each other, like the leaves of a partially-opened book and presenting a vertical face on the east

side and deep cracks on the north and south sides between the successive leaves.

The second tower, unnamed, is more regular in shape and from the east resembles a massive turret with innumerable vertical grooves cutting its face from top to bottom and portholes dotted here and there at various levels.

We followed the trail down towards Forty Mile Creek for about a mile and then led our ponies over the ridges through burnt and fallen timber for another mile until further progress with them was impossible. Here they were tethered for the day and we continued over the hog-backs to the summit of the green-covered shoulder at the northeast base of Louis, the barometer showing 7,000 feet elevation. The hard going over the innumerable ridges and the final climb up the shoulder made a second breakfast most welcome, and soon the good food and warm sunshine threw all of us into that dreamy state of delicious indolence when any movement is an effort and one is content to lie and gaze at the figures and images outlined by the cracks on the rock walls and to work out possible lines of ascent without trying them. And thus we probably would have spent the day had not Conrad's audacious look through massive vertical slabs, and bold assertion that my suggested route up a chimney showing at the base on the north side of the tower would either pinch or terminate in an impossible overhang, broken the spell for me, and I immediately set out to explore the route and prove his mistake.

At the same time, Conrad began a traverse along the ledges on the east side of the mountain and it took me over an hour of strenuous climbing to rejoin him beyond the couloir on the east face and admit that he actually could see through solid rock; for my chimney, after running up for several hundred feet, terminated with smooth side walls and a smooth overhanging cliff at the top, with apparently no outlet from this *cul-de-sac*.

At twelve o'clock we continued up the ledges on the south side of the couloir above the snow patches until we reached the last horizontal ledge or terrace and here we cached our ice axes. This terrace carried us toward Mount Edith, to the base of the red, vertical slab south of the couloir, and there broke off abruptly with a rough face dropping for about one hundred feet and seemed to terminate in a sheer drop of several hundred feet to the pass between Edith and Louis. While Conrad made a study of the section along the south edge of the slab, I tried the broken ledges to the north and worked up for about fifty feet until I came to a blank wall with no way around it, and in descending was forcibly impressed with the fact that an ascent on vertical stretches with narrow hand and foot holds is far easier than a descent. Upon rejoining Conrad at the base of the slab, I found him gazing at the narrow, vertical face-crack on the slab, and unlacing his boots. The prospect did not please me at all, and, in order to save him further trouble and perhaps to save my face, I emphatically said "No," and the boots were laced up again. The south side of the slab had proven as impossible as the north side and the two-inch crack seemed to offer the only possible line; but the day was early and I was in no condition for thirty feet of finger and toe exercise such as this crack would have necessitated.

The chimney over the north branch of the east face couloir pinched at the top and showed a decided overhang for about ten feet, while the south branch chimney, although not visible throughout its entire length, seemed to end in the same way, and both of them carried only to the base of the first leaf of slabs that form the summit of the mountain, with no indication of what lay beyond it; so we decided to work down the south side of our terrace and, at a point about twenty feet above the vertical cliffs, worked a traverse along narrow ledges and up two short, broken chimneys that finally carried us

over a rib into the steep cut that is a prolongation of the crack between the second and third leaves of the summit formation.

We were now on the south side of the mountain, with the walls just below us dropping sheer to the pass, while, a short distance above, a vertical face stepped the bed of the cut up between two smooth side walls, thus blocking its ascent. From near the bottom of this cut we worked up and down over rock faces and one long, diagonal angle-crack between a cliff of the mountain side and an outlying rib, and landed on the edge of the lower stretch of the third leaf of the summit mass. From this point we had a clear view up a narrow couloir, of which stretches were almost chimneys, to the top ledges of the massif below the final tower. Fortunately, our position on the rib was forty feet or more above the abrupt ending of this couloir over the cliffs, so we roped down from a projecting rock about twenty feet into the bottom of it. This point we reached at 2.30 p.m. and the barometer read 7,800 feet.

The couloirs and chimneys from here to the base of the final tower are narrow and the faces and sides are rough, making the ascent safe but exhausting, as many of the stretches are very steep. The ascent of five hundred feet to the terrace at the summit of the massif took forty-five minutes. Upon reaching the terrace, we rested and gazed at a most interesting prospect; running up between the third leaf and the main tower was a steep pitch and then a black chimney, apparently going to the very summit, no more than a crack in the face of the cliff, with two perfectly straight walls and the inner face so deep inside the cliff that it would not be seen; a truly wonderful chimney to delight the most exacting climber. With such limited space to work in, we hastily cached our ruck-sacks and rope and made for the final test, for it was apparent that if the crack above was wide enough to admit our bodies we were certain to reach the summit,

but if it should prove too narrow to enter, then we should have to try one of the nearly vertical edges, with a leg and arm inside for pressure holds and the other two members on the face of the cliff to take advantage of whatever irregularities were found to offer a hold and footing, a very doubtful expedient, owing to the great height to go.

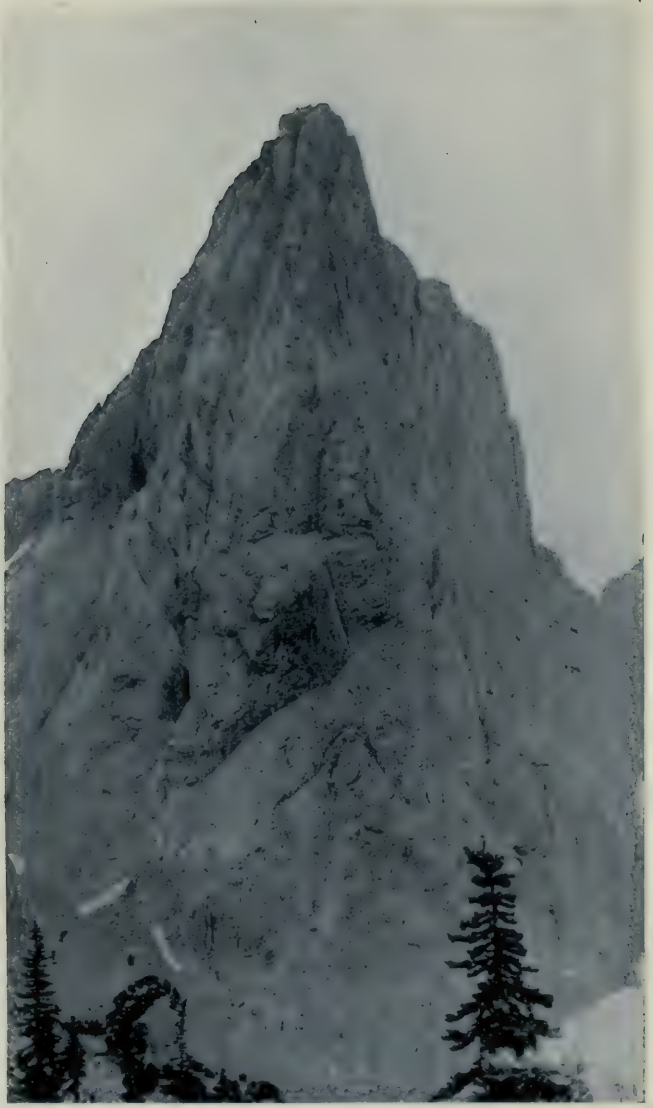
Crossing the terrace, we found the first stretch of seventy-five feet a steep scoop with rough surface and easy going. This carried us directly into the chimney, which proved just wide enough to admit my shoulders with a slight squeeze. We walked into it for about ten feet to the back face, which went up at a seventy-degree pitch, and looking up we saw perfectly smooth walls on each side and a narrow strip of blue sky far above, the back face continuing from ten to fifteen feet inside the outer edges of the crack. Here was a real chimney, the kind one speculates about but the like of which I never before had seen; with side walls so smooth that they afforded no hold or footing at all, the inner face so covered with ice that only an occasional footing was available, and the climb so high that the all-important question was whether or not one's strength would hold out until the top was reached. However, the chances for success inside the crack were so great over the chances on a route at the outer edge, that we did not stop to reckon with our wind or strength, but wedged ourselves in between the walls and climbed up the inner face as far as it afforded us a footing on the rock pile at the bottom, and then began with pressure holds, first pressing hard with the arms and shoulders and with the palms of the hands flat against the walls near the waist line until the knees were drawn up as far as possible, then with edge nails scraping the sides and a pressure with the knees and thighs, a hold was afforded long enough to raise the body for a fresh pressure with shoulders and arms. At one point the walls gradually pinched until, for about

ten feet, it was necessary to turn the body sideways and, as the space was too narrow to allow the knees to be used, this stretch was doubly hard. Thus we climbed, with an occasional interval of rest whenever the inner face presented a footing, until we reached the sky itself, only to find that we still had two wide chimney-stretches of about 125 feet to the final slab on top. Clouds were now settling over the peak and a light drizzle began, which warned us to make haste, but a hundred feet of this sort of climbing had told on us heavily so we rested, and, gazing into our black well, we speculated as to how our hands and elbows would fare when braking down such a stretch, for, although the body had to be lifted when ascending, the danger of a fall was slight so long as strength lasted, while on the descent we realized that when the body was in motion, a slip, or too much speed, would prove disastrous.

The drizzle quickly turned to sleet and this drove us hastily up the two remaining chimney stretches, the first narrow and deep for about fifty feet, and the second of seventy-five feet, with wide, flaring sides, until it ended at the base of low, broken cliffs at the summit, which we reached at 3.50 p.m., the barometer reading 8650 feet.

Conrad's yodel announcing our success was a welcome signal to our friends below, for, after following our course with a glass until we disappeared on the south side of the mountain, they lost sight of us and immediately worked around over the pass to the glacier northwest of Edith, when they again were able to follow much of our route until we reached the base of the final tower, which appeared from below to offer no possible line of ascent, as the crack looked to be impracticable. Our sudden appearance at the summit was a great surprise to them.

The wind was cold and the snow-squall rapidly increased, so we spent little time examining the formation of the other sides of the mountain. From the summit we



Photo, W. E. Stone

MT. LOUIS FROM SOUTHEAST

could see no route that seemed at all inviting and decided it safer, under the circumstances, to retrace our steps. We built a small cairn and deposited a record in a tobacco box, and began the descent at 4.10 p.m., well aware that the hardest part of the climb lay before us, for, with tired muscles and scratches and bruises all over our bodies, the hours of constant tension to avoid one careless move or mis-step and to touch no loose rocks was certain to tax us to the limit of endurance.

For almost the entire length of the couloirs and wide chimneys we faced out and heeled down, pressing the side walls with the palms of our hands that seemed to strike every sharp point or edge along the route. Leather gloves would have saved us many cuts, but there was need for every finger nail in many stretches, so the flesh had to make its sacrifice and bear its pain.

The walls of the narrow chimney were now dripping with water and made its descent very slow, for the long, nearly straight drop to a mass of sharp rock at the bottom was constantly before our eyes to warn us of the dangers of an uncertain movement. Under the same conditions, had this chimney been a few inches wider, such a descent would have been almost impossible, for it still would have been too narrow for back and knee work, while the increased width would have made too great a space to cover by chest expansion for arm pressure.

Great care was necessary on Conrad's part to retrace our steps as nearly as possible, for it was apparent during the climb up that many cuts and ribs offered a line of ascent for long stretches, only to end in an impasse, and for us to come down on any one of such routes would mean a climb up for another start. At 5.30 we reached the point where, on the ascent, we had roped down from a rib into the couloir, and here considerable time was required to throw a loop of the rope from such a confined space over the projecting rock above. After many trials, it finally was accomplished and we then

began the diagonal traverse above the cliffs on the Edith Pass side. This stretch without doubt was the most dangerous section of the whole climb and especially for the descent. The route was irregular and in most places ran along narrow ledges, with scanty finger holds in small cracks and over rib ends, and with sheer drops everywhere along the line to the pass below. We, therefore, double roped along and down from every point which afforded even the slightest anchorage, and, although the rope was not depended upon for assistance, we were grateful for the assurance it gave in case of actual need. This stretch and while roping down into the couloir were the only times when the rope was used on the climb.

At six o'clock we reached the base of the red slab on the east face, and, picking up our ice axes at the north end of the ledge, made rapid progress directly down the east couloir, reaching the high snow patches at 6.40 and the scree slopes below at 7.45 p.m. Our party lost sight of us when the descent began and, late in the afternoon, were filled with apprehension when they noticed on the big snow-patch below the east couloir two dark spots that were not there in the morning; but Conrad's mountain yell from the scree slope belied the suggestion of disaster and we made off in a straight line for the meadows where the ponies had been taken. Upon reaching the edge of the timber east of Mt. Edith, we stopped and looked back at our mountain, which towered up magnificently in the dusk, and Conrad spoke volumes when he said, "Ye gods, Mr. MacCarthy, just look at that; they never will believe we climbed it."

SCIENTIFIC SECTION

VEGETATION DISTRIBUTION IN THE ROCKY MOUNTAINS PARK

By Francis J. Lewis

The study of the vegetation of a district may be approached from several different points of view. The systematist may compile a list of species existing in a region with an indication of their relative abundance, and this is extremely useful work of fundamental importance in the study of vegetation from any point of view. At the same time such work gives little information about the distribution of the vegetation and its grouping into definite units or associations, according to the influence of external factors.

Ecology—a comparatively new science, barely twenty years old—is concerned in one of its aspects with the recognition of vegetation units, their inter-relationship, and the effect of soil and climatic factors upon their distribution. Another important field of Ecology is concerned with the succession of different forms of vegetation; for as sunlight and shade, mist and rain sweep across a landscape, so different forms of vegetation clothe the mountain summits, slopes and valleys at successive periods.

During the last fifteen years, a great number of investigations have been carried out along these lines in nearly every country in Europe, in New Zealand, Australia and many of our Tropical Possessions and in the United States.

Several different kinds of vegetation units can be recognized. Formations may be either climatic or

edaphic. In the first we deal with broad, general types of vegetation obviously determined by widespread climatic features, such as the primary divisions of the plant-covering into woodland, grassland and desert. These divisions are of use in attaining a general view of the vegetation of a continent from a purely climatic aspect. Edaphic formations are smaller units determined by more local climatic and soil conditions, the concept of an edaphic formation being physical rather than floristic. Thus, it is permissible to speak of an oxylophyte formation, meaning thereby a set of plants covering acid humus soil without special reference to the species, although the vegetation in such habitats possesses certain common physiological features in all parts of the world.

Formations are resolved into associations which may be described as communities of plants growing under similar conditions. These are usually quite as definite and as easily recognizable as the different kinds of rock, and the boundaries may be laid down upon a map with the same precision with which the geologist maps different rock formations. Vegetation maps give the best indication of the economic possibilities of a country and are the most satisfactory basis for comparing the vegetation of different regions, one with another. To the mountaineer, they afford an excellent guide to the best route in approaching or making a climb, and the delineation of plant associations on a well contoured map enables anyone used to map reading to form a mental picture of scenery in a way approached by no other method. It was with a view to studying some of the plant associations of the Eastern Rockies that the writer began a survey of the Banff District in 1916. The area chosen extends from near Canmore on the C.P.R. in the east to Castle Mountain in the west, and Simpson Pass in the south to Lake Minnewanka in the north, an area of about 216 square miles.

The following account of the vegetation is only tentative, as another two years' work will be necessary to complete the map and study the many special problems in connection with plant successions.

It is hardly necessary to say anything about the general topography of the district, as this is familiar, to some extent at any rate, to all members of the Club.

The following forms of vegetation are well represented:

(*a*) Forests,
(*b*) Heaths,
(*c*) Grasslands,
(*d*) Alpine mat-herbage and Alpine mat-grassland,
(*e*) *Menziesia* association,
(*f*) Moraine vegetation and screes.

(*a*) Forests. Three types of trees dominate the forest land:

(1) *Pinus contorta Murrayana,**
(2) *Picea Canadensis,*
(3) *Picea Engelmannii.*

(1) *Pinus contorta* is chiefly confined to the valleys and lower slopes, seldom occurring as forest above 6,500 feet. This tree gives the characteristic appearance to the forest land far more than either of the other two species. *Pinus* forest is especially well developed in the Bow Valley westward from Canmore, in the Spray Valley, and thence branching up the larger tributary valleys, such as Healy and Brewster Creeks.

The foliage permits a greater entrance of light than the other forest trees, and thus a more abundant undergrowth occurs, characterized by such shrubs as *Shepherdia Canadensis, Menziesia glabella,* and herbaceous plants, *Arctostaphylos uva-ursi, Anemone multifida, Zygadenus chloranthus, Listera convallarioides, Calypso bulbosa, Habenaria obtusata.* The lower slopes in many cases

* The writer is indebted to J. M. Macoun, Esq., Acting Head of the Division of Biology, Department of Mines, for help in the determination of some of the plants mentioned in this paper. The nomenclature is that adopted by the Vienna Congress 1905.

have been burnt over and the second growth pine varies in age from fifteen to twenty-five years. The extremely low temperatures of the winter of 1915-16 caused the frosting of large areas of pine, the whole foliage being killed on the slopes of Mts. Inglismaldie and Rundle at about 6,500 feet to 6,000 feet. The damage appears to be more severe on slopes with a western exposure than elsewhere and *Pinus* on slopes in the Yellowhead District appears to have suffered in the same way.

(2) *Picea Canadensis* forest occupies three entirely different habitats and in each case is accompanied by a distinct ground flora. In the Bow Valley, westward of Banff, it occupies marshy flats associated with willows and sedges.

Between 4,500 feet and 7,000 feet it covers rocky slopes almost bare of soil and clothes the steep sides of the smaller lateral valleys opening out of the Bow Valley into the Sawback Range, and often occurs as a narrow band above the *Pinus* forest.

The most characteristic habitat is that of the floors of some of the deep valleys, such as Healy Creek and Mount Edith Trail. Here, the spruce grows in close canopy, permitting little light to reach the undergrowth which is sparse and consists chiefly of a thick carpet of moss (*Hypnum crista-castrensis* L.) with *Linnaea borealis* var. *americana, Moneses uniflora, Clematis columbiana, Zygadenus chloranthus.*

(3) *Picea Engelmannii* only forms forest near the tree limit (about 7,000 feet) and does not cover any extensive areas in the district. It is clearly distinguishable from the white spruce by its heavier and more massive outline and can be recognized in a good light, at a great distance, by the yellowish bronze color of the foliage, contrasting with the dark green of the white spruce. It is common at the tree limit on Mts. Inglismaldie, Cascade, Norquay and the Bourgeau Range, and is found best developed on slopes facing

north. Although burning has occurred extensively in most of the pine and white spruce forests, there is no evidence of fires having extended into any of the Engelmann spruce areas. The soil always consists of a fairly deep humus, with snow patches lingering on until well into July, and this may account for the forest fires having failed to penetrate into these areas.

Two other trees, *Larix Lyallii* and *Abies lasiocarpa* (balsam fir) are always found associated with the spruce and there appears to be some evidence that the balsam fir is tending to replace Engelmann spruce, as seedlings of the latter are common, whilst most of the Engelmann spruce is of mature age.

The region of the tree limit is one of considerable interest, as it is here that a number of herbaceous plants disappear and a new flora makes its appearance.

Some measurements of the rate of growth of different species of trees may be of interest as showing the variety of conditions existing at about 7,000 feet.

Species	Locality	Age Years	No. of Rings per inch
Abies lasiocarpa	E. side Cascade Mt... 7,100 feet	167	40
Abies lasiocarpa	E. side Cascade Mt... 7,100 feet	34	30
Larix Lyallii	E. slopes Cascade Mt. 7,100 feet	37	32
Picea Engelmannii	W. slopes Cascade Mt. 7,100 feet	65	32
Picea Engelmannii	W. slopes Cascade Mt. 7,100 feet	280	40
Pinus albicaulis	Summit Sulphur Mt..	272	145

(*b*) Heaths are associated with the more open Engelmann spruce forests at about 6,800 feet to 7,200 feet, often extending for some distance outside the shade

of the trees. In August these heaths (Fig. 1) are covered with the white bell flowers of *Cassiope mertensiana.* This is always the dominant plant and associated with it are *Phyllodoce empetriformis, P. glanduliflora, Mitella breweri, Viola orbiculata, Pedicularis bracteosa, Saxifraga lyallii.* At Simpson Pass (7,200 feet) deep snow-patches often lie until late in August, and in such places an interesting flora is met with, known as the snow-patch flora. This has been studied in some detail in the European Alps. Snow-patches are shallow basins or flat spots where the snow remains lying until late summer, and are characterized by a soil of black, wet humus. As the snow recedes a characteristic flora appears, the following plants being most noticeable: *Erythronium grandiflorum* var. *parviflorum, Anemone occidentalis, Ranunculus eschscholtzii Valeriana sitchensis, Antennaria racemosa, Carex scirpoidea* var. *stenochlaena.* Some of these plants, notably *Erythronium* (snow lily) can often be seen in flower at the edge of the snow-banks in August.

(*c*) Grasslands. Many of the lower slopes throughout the district are covered with a dry type of grassland and are the most unattractive regions in the district. The most characteristic plants are grasses, Leguminoseae, and scattered shrubs of *Shepherdia* and *Rosa, Castilleja lancifolia, Sedum stenopetalum.* Most of these slopes occur between 4,500 feet and 6,000 feet, although grassland of this type occupies burnt-pine areas up to 6,700 feet on the western slopes of Cascade Mountain.

(*d*) No vegetation in the district stands out with greater distinction than the green, herbaceous areas occurring at altitudes between 6,300 feet and 7,500 feet. The vivid green forms a beautiful contrast with the gaunt outline of burnt timber, the sombre colour of the spruce area, or the bare, gray rock of the upper slopes, giving the effect of a flower garden in the wilderness. The

boundaries are marked with extraordinary sharpness. The term alpine meadow as applied to this type of vegetation is rather a misnomer. Meadow, from the ecologist's point of view, is a community of tall long-stemmed grasses with a mixture of perennial herbs, and does not resemble these green areas either in the Rockies or the European Alps. In reality two types can be recognized: Mat-grassland and Mat-herbage. The former is characterized by an abundance of grasses which develop late in the season, whilst in the earlier part of the summer (Fig. 2) the ground is carpeted with flowers. The latter is dominated by herbaceous perennials with occasional grasses. The former is luxuriant in growth and often attains a greater height than one foot, whilst in the latter the plants are smaller, usually of the rosette type, and cover the ground much more sparsely. Figures 2 and 3 show the great difference in appearance of these two types in August.

The floristic differences are indicated by the following brief list of plants: *Mat-grassland — Anemone patens, Delphinium nelsoni, Aquilegia formosa* var. *flavescens, Tellima parviflora, Heuchera glabella, Myosotis alpestris, Rhinanthus crista-galli, Castilleja hispida, Zygadenus venenosus, Poa crocata, Koeleria cristata, Elymus dasystachys. Mat-herbage — Dryas octopetala, Potentilla glaucophylla, Sibbaldia procumbens, Saxifraga adscendens, S. caespitosa, S. nivalis, Poa alpina, Festuca ovina* var. *brachyphylla.*

Perhaps the best example of mat-herbage is on the rounded summit of a spur of Mt. Inglismaldie at 7,400 feet, illustrated in Fig. 3. It would be difficult to imagine anything more beautiful than the mingling of the vivid blue, yellow and white of the *Myosotis, Potentilla, Dryas* and *Saxifrage.*

All the areas of mat-grassland face south. An excellent illustration of this, visible from the windows of the Alpine Clubhouse at Banff, occurs on Mt. Norquay.

The small ravines on the eastern face of Norquay have flanks with an inclination of about 35 deg. The flanks facing south form a vivid green strip down the mountain side from about 6,800 feet to 5,600 feet, whilst the flanks facing north are covered with a totally different vegetation of *Menziesia glabella* with many other shrubs. This striking feature can be seen in many places on the Vermilion Range and the Bourgeau Range, and gives an excellent illustration of the effect of aspect causing differences in light, temperature and soil.

(*e*) *Menziesia* association extends in an unbroken zone from the eastern side of Mt. Norquay along the northward-facing slopes of the Sawback Range above Forty Mile Creek, from 4,600 feet to 6,900 feet.

Nearly the whole area has been burnt over, and fallen trunks of spruce and pine litter the ground. The dominant is *Menziesia glabella,* with *Rhododendron albiflorum, Alnus tenuifolia, Salix glaucops, Ledum groenlandicum* and a herbaceous vegetation of *Vaccinium scoparium, Pedicularis groenlandicum, Arctostaphylos uva-ursi* with many mosses and lichens. This forms by far the most impenetrable vegetation of the district. It occurs on slopes of 30 deg. to 45 deg. inclination, and is best developed where it faces north and on deep, wet humus. There is reason to suppose that this is a characteristic vegetation in the Selkirks, attaining there a far greater importance than in the Rockies.

(*f*) The colonization of old moraines and rock-slides, and the successions occurring in these situations with increasing age, present many problems of extreme interest to the botanist and geologist. Throughout the district at about 7,000 to 8,000 feet there are fine examples of cirques with series of moraines deposited during the retreat of the glaciers which formerly occupied the cirques. The successive moraines are covered with entirely different plant communities. The oldest moraines are covered with a considerable depth of

Photo, F. J. Lewis Figure 1

ENGELMANN SPRUCE SLOPE WITH CASSIOPE ASSOCIATION
6900 ft. on North Slopes of Mt. Louis

Photo, F. J. Lewis Figure 2

ALPINE MAT—GRASSLAND
6500 ft. on Mt. Norquay

Photo, F. J. Lewis Figure 3

ALPINE MAT—HERBAGE

Photo, F. J. Lewis Figure 4

OLDEST TYPE OF MORAINE VEGETATION; DOMINATED BY PICEA ENGELMANNII AND CASSIOPE

7100 ft. on Cascade Mt.

Photo, F. J. Lewis Figure 5

YOUNG TYPE OF MORAINE VEGETATION; DOMINATED BY SALIX NIVALIS AND DRYAS OCTOPETALA

7100 ft. on West Face of Cascade Mt.

humus and support an open forest of *Picea Engelmannii* with an undergrowth dominated by *Cassiope*. This type is illustrated in Fig. 4. The trees average about three hundred years in age.

The youngest moraines are bare of humus and are sparsely covered with a small creeping willow *Salix nivalis, Dryas octopetala, Lychnis apetala, Poa alpina.* These are the early pioneers of the rocky waste, often driven back by snow-slide and rock fall, yet ever advancing, covering the bare rock with a layer of humus and preparing the way for more stable forms of vegetation.

FAUNAS OF CANADA

By P. A. Taverner

(*Reproduced from The Canada Year Book*, 1915)

Whether the fauna of the western hemisphere was derived from that of the eastern, or *vice versa*, as is contended by various authorities, there is a clear relationship between them, and one of these contentions is certainly true. Geological evidence shows that in previous ages the northern circumpolar life was even more homogeneous than to-day, and types now found in but one of the great continental circumpolar divisions were once common to both. Old and now submerged land connections between the continents have been postulated both from zoological and geological evidence, and a more or less complete continuity of land throughout the northern hemisphere, in former times, must be acknowledged before present American biotal conditions can be thoroughly understood. That this connection was in the far north and in what is now Arctic or sub-Arctic climate did not prohibit a continual interchange of warmth-loving species, for the presence of coal in very high latitudes points to milder, if not tropical or sub-tropical, conditions where now we find perpetual snow and ice. We must, therefore, conceive of a pre-glacial time when tree-ferns and other luxuriant coal-producing forests occupied extreme northern lands, and such species as elephants, horses and other warmth-loving species could spread from one continent to the other.

At this time the entire northern hemisphere was probably peopled by an essentially similar population developing along approximately parallel lines through a more or less free interchange of individuals. These conditions, however, were interrupted by the breaking

down of the land connecting the continental areas and the occurrence of the glacial epochs,* when solid ice covered a large part of the northern hemisphere in North America south to below the Great Lakes. Probably this resulted, over the whole of Canada, in conditions closely approximated to those at present found in Greenland, and a temperate climate did not occur short of the Gulf States. Though these Arctic conditions prevailed gradually, they none the less inevitably blotted out the original population of the sub-tropical north.

The species that were of too inflexible a nature to adapt themselves to new conditions, or forsake their ancestral habitats, became extinct and perished entirely; some more adaptable, while they retreated before the face of the oncoming ice, became hardier and capable of living in temperate or sub-Arctic climates, and others more easily moved were driven far south, perhaps into South America, where in competition with forms already resident they either triumphed at their expense or succumbed, as the case might be. The survivors under new and various influences evolved into numerous new forms and differentiations more or less distinct from the original stock. These conditions prevailed for what can be historically regarded as great periods of time in the process of which an originally continuous and fairly homogeneous world population became a number of isolated units, differentiating along independent and often divergent lines. Some forms in each hemisphere disappeared, specializations of old ones arose, and the bases of the peculiarly characteristic Faunas of the two great continental areas were laid.

On the gradual retreat of the great ice barrier to intercontinental communication at the beginning of the present geological era, many descendants of the species

*Though here treated for convenience and clearness as but one single occurrence, it should be borne in mind that the glacial epochs were composed of a number of advances and retreats, more or less complete, of the ice cap with various intervals between. This, however, does not seriously alter the zoological results here stated.

that had been driven south gradually returned, following as closely upon the edges of the withdrawing ice as their natures and requirements permitted. Some were satisfied with their acquired southern homes or were more able to retain them in competition with their neighbours; they remained and probably became the ancestors of our present typically southern genera; but others seized with avidity upon the opportunity to occupy the gradually opening countries to the north, where competition was relaxed, and each succeeding spring advanced as far into them as climatic conditions permitted or competitive necessity demanded. Thus the north again became repopulated, but not with similar forms in both continents. On the contrary, each was supplied with forms made widely dissimilar through their enforced disconnected residence and divergent development.

During this re-occupation a number of interesting things happened. High elevation is comparable in the condition it originates to high latitudes, and mountains, even in the tropics, if high enough, are covered with perpetual snow. High mountain and Arctic conditions are similar and have little variety. Consequently, as the glacial ice withdrew first from the warmer lowlands, some species adapted to the colder climate, instead of following the retreat along the valley lines northward, merely climbed adjacent slopes and there found acceptable habitats. If the mountains were too low to retain their Arctic character in sufficient degree, those forms perished and were replaced by the next succeeding association until a permanent population was at last secured. If the elevation were greater the Arctic forms survived as isolated communities, and hence to-day we sometimes find Arctic forms on high tablelands and mountain ranges separated by many hundreds of miles of warm climate from their nearest allies.

It is obvious that these cold loving "relicts" of a

previous order should, in the natural state of things, have been the last to break their connection with the European or Asiatic continent and the first to come again into contact with their old allies. In some cases probably the very hardiest never completely lost touch with each other across the frozen wastes of separation. Arctic conditions are remarkably similar the world over, and these forms just clinging to the edge of habitability existed under like conditions and with far less stimulus to divergent progress than those in the warmer and more varied south. Evolutionary development is slower in the colder than the warm climates; generations are, on the average, slower of development and slight departures from a narrow successful groove are more ruthlessly weeded out; in fact there is less latitude between success and failure and fewer chances of departures from types being beneficial. All these reasons worked to the single end that the northern or Arctic fauna was during the glacial epoch much less differentiated in the eastern and western hemisphere, and to-day we find those of the northern areas are remarkably similar, and the circumpolar fauna is nearly identical throughout the circle. So in America we have a distribution of life closely related to European and Asiatic forms in the north, but gradually and regularly differentiating into peculiar and special forms as we proceed south.

Having considered the history and consequent relation of North American life to that of the world in general, we can take up the details of its distribution on our continent. The general trend of geographical distribution in Canada is from southeast to northwest. Ocean currents have much to do with this. Our east coast is chilled by the cold Arctic current coming directly down from the polar ice fields through Davis Strait, and the west coast is warmed by the grateful temperature of the great final sweep of the Japan Current. When we realize that the barren Labrador

coast of the Gulf of St. Lawrence is in almost the same latitude as southern British Columbia and is slightly south of the most southerly point of the British Isles, we can see what a great and fundamental influence these ocean currents have on the distribution of life upon our continent.

The general outline of zonal life distribution is well known. All are familiar with the fact that tropical life differs from temperate and from Arctic. Close study, however, shows that besides these broad and obvious associations are minor ones. Various attempts have been made to map them out, and perhaps the most successful and generally accepted one for our purposes is that by Dr. C. Hart Merriam. This divides North America into three regions, a Boreal, Austral and a Tropical one, with the first two each divided into three life zones: the Arctic, Hudsonian and Canadian zones for the Boreal Region and the Transition, and Upper and Lower Austral zones for the Austral Region. In Canada, we have five of these zones represented from the north: the Arctic, Hudsonian, Canadian, Transition and Upper Austral. These extend across the continent, roughly agreeing with latitude, but thrown out of regularity, as previously indicated, by local conditions and agreeing closely with the midsummer isotherms or temperature belts.

The Arctic Zone is the barren land of the far north, treeless and almost shrubless, and extends south to include all the north shore of the continent as well as the islands above. The distinctive land mammals of this zone are the Polar Bear, the Musk Ox, Barren Land Caribou, Arctic Fox, Arctic Hare and Lemming. Amongst the characteristic birds are Snow Buntings, Ptarmigan, Longspurs, Snowy Owl and the Gerfalcons. This is the great nesting ground for many of our waders and more northern ducks and geese. There are few residents, as most forms migrate in winter.

Figure 1

WILLOW PTARMIGAN IN THE MOUNTAINS OF BRITISH COLUMBIA

Photo, P. A. Taverner

Figure 2

GANNET OR SOLAN GOOSE

The Hudsonian Zone is the land of scrub forests, small stunted trees, mostly coniferous, and scattered dwarf willows and poplars. The southern boundary of this zone extends from the north shore of the Gulf of St. Lawrence near the mouth of James Bay, thence in a wavy curve to Great Slave Lake, where it drops south suddenly to a latitude about on line with the lower point of the Alaska Pan-handle, and thence to near the coast. It thus includes the southern Ungava peninsula, a narrow belt extending northwest from James Bay, the Yukon, northern British Columbia and southern Alaska. It is penetrated from the north by the Arctic Zone which persists on the mountains of the Yukon and from the south by the Canadian Zone which follows up the valleys of the Mackenzie and Peace Rivers. It is shut off from the sea on the Pacific side by the Alaska Pan-handle, which has an intrusive Canadian fauna. On the other hand, it works down the Rocky Mountains in a narrow band and scattered isolated spots to across the United States boundary. This zone can be considered more as a transition between the Canadian and Arctic zones than a primary division itself. It contains species whose centres of abundance are on either hand and a few peculiar to it. Musk Oxen, Caribou and Ptarmigan range into it in winter from the north, and it forms the extreme northern distribution of Wolverine, Woodland Caribou and Moose. Its most characteristic birds are the Rough-legged Hawk, Great-gray Owl, Northern Shrike, Pine Grosbeak, White-winged Cross-bill and Fox Sparrow.

The Canadian Zone occupies the greater area of Canada and can be roughly defined as the heavy coniferous forest belt. It includes practically all the remainder of the Dominion except the inner shores of the Nova Scotia peninsula, southern Ontario and Quebec in a narrow strip from about Montreal to just below Georgian Bay on Lake Huron, the prairies, a small irregular fringe along the Pacific coast opposite Vancouver Island and a few

mountain valleys penetrating the southern boundary of British Columbia. Beyond our borders it extends irregularly south on the mountains and high land near both coasts, including the south shores of Lake Superior, and penetrates the Hudsonian Zone on the north along the valleys of the Mackenzie and Peace Rivers and runs up most of the Alaska Pan-handle. This is the first land fit for systematic cultivation. The characteristic life is more numerous than in the preceding zones and includes the Moose, Woodland Caribou, Lynx, Marten, Porcupine, Varying Hare, White-throated Sparrow, numerous warblers, Olive-backed Thrush, Three-toed Woodpeckers, Pileated Woodpecker, Spruce Grouse and Canada Jay.

The Transition Zone is agriculturally the most important Canadian faunal division. It lies just along the southern border, including most of both shores of the Bay of Fundy, Quebec below the Gulf of St. Lawrence, a narrow belt following the north shores of Lakes Ontario and Erie, all of the western prairies and intrusive valleys into the south of British Columbia and the shores of the Strait of Georgia. The name Transition well describes this fauna. It contains comparatively few distinctive species, but is where many northern and southern forms meet. Except in the prairies it is the country of the hardwood forests where many of the temperate and hardier fruits, vegetables and cereals reach their highest perfection and is the northern limit of some of the tenderer ones. Its southern limit lies in the United States below, striking almost squarely across the continent on a line with the lower points of the Great Lakes, with excursions southward along the mountain ranges east and west and penetrated by extensions of the Upper Austral fauna along warm lowland valleys in the west. It forms the northern limit of range of the Cotton-tail and Jack-Rabbits and the American Elk, and is just touched upon by the Varying Hare from the north; the

Common Mole of the south meets the Star-nosed and Brewers Mole of the north and the Wild Cat partially replaces the Canada Lynx. Amongst birds, the Wild Turkey, Bob-white, two Cuckoos, Towhee, Wood Thrush and Yellow-Vireo are at the northern limit of their ranges, and the Baltimore Oriole, Bluebird, Catbird and Bobolink overlap the solitary Vireo and Wilsons Thrush.

The Upper Austral Zone in Canada is small in area but important in production. It just crosses our borders in a narrow shore belt along Lake Erie extending to the south side of Lake Ontario, including the Niagara Peninsula. It forms the famous Ontario fruit belt and is comparatively strongly marked by quite a number of characteristic forms especially amongst plants. It extends south as far as the northern borders of the Gulf States, variously dotted and cut into by intrusive branches of the neighbouring faunas from either side, especially in the broken country of the West.

There are not many peculiar mammals that are well known to the general public, and perhaps the Opossum is the most distinctive. Among birds we have the Yellow-breasted Chat, Mockingbird, Carolina Wren, Carolina Chickadee, Orchard Oriole, Barn Owl, a number of distinctive southern warblers and southern sub-specific forms allied to more northern variations.

These make the latitudinal or thermal divisions of our faunal life. Outside of the species mentioned are numerous forms that extend over the whole area, but show in different zones variations recognizable to the expert, but stopping short of specific distinction. A good example is the Hairy Woodpecker. This bird breeds over all the wooded parts of North America, but the birds from the Lower Austral Zone are quite separable by the trained eye from those of the Upper Austral and Transition and these from the large northern form of the Hudsonian. This is but one case of many where a northern and a southern race exist in the same species and which we

designate subspecies. Some of these geographical races are so slightly differentiated as to require an expert to separate them, while others are marked and striking. The critical difference between a full species and a subspecies is the fact that the latter intergrade and blend into each other gradually. With species the break between is sudden and intermediates do not occur.

With this zonal distribution and a variation of life groups depending basically upon temperature, we have another system of distribution east and west, depending largely upon physical conditions of habitat—the arrangement of land and water or mountain ranges forming barriers or highways of migration and leading certain forms in certain directions while barring them from others—and the comparative rainfall and humidity of climate. This has a primary direct influence upon the forms of life we are considering, as well as a secondary and indirect one through the plants and insects which give them food or shelter.

The principal divisions east and west are divided by the Rocky Mountains, which successfully cut the Pacific coast off from close contact with eastern forms. This great backbone of the continent extends in a northwesterly direction and forms the political boundary between Alberta and British Columbia. An extension of this line until it strikes the centre of the main Alaska-Yukon boundary roughly approximates the dividing line of the east and west faunas, leaving a triangular patch to the west, including British Columbia, southern Yukon and southern Alaska as the western or mountain fauna, and cutting through three of the transcontinental zones, the Transition, Canadian and Hudsonian with fragments of the Arctic on the higher elevations to the north.

The mountain district is characterized by an abundant rainfall, a high average humidity and a greatly diversified and rugged topography, forming a succession of mountain ranges with deep valleys between, paralleling the

coast, facilitating intercommunication in this direction but obstructing it from east to west. These topographical conditions continue to the south well into Mexico and enforce migration routes and conditions and associations more or less isolated. The marked humidity of the climate, especially near the coast, also causes or encourages special physiological changes in numerous organisms tending as a rule to produce larger size and browner or richer colouration. These differences in physical conditions and the isolation formed by the barrier mountains have produced a great number of forms peculiar to the trans-mountain district. In fact, comparatively few species, either of birds or animals, extend across the mountains from the east unmodified, and the native population can be divided into three heads: subspecific variations of eastern forms, species confined to the area and forms of evident mountain origin but spreading from them a certain distance eastward. Typical amongst the first may be mentioned the Moose and Woodland Caribou, the Oregon subspecies of the Ruffed Grouse, Harris', Rocky Mountain and Gairdner's Woodpeckers, Northwest Flicker, Dusky and Streaked Horned Larks, many forms of the warblers and sparrows and others.

Of full species confined to this fauna are: Douglas Squirrel, Black-tailed Deer, Pica, Yellow-bellied Marmot, Bushy-tailed Wood Rat, Little Striped Skunk or Spilogale, Blue and Franklin's Grouse, Band-tailed Pigeon, Red-breasted and Williamson's Sapsucker, Steller's Jay, Black and Vaux Swift, Black-chinned and Rufus Hummingbirds, Clark's Nutcracker, Northwestern Crow, Dipper, Chestnut-backed Chickadee, Varied Thrush and others. Of forms typical of the mountains but spreading a little way east are: Hoary Marmot, Mule Deer, Grizzly Bear, Red-naped Sapsucker, Lewis's Woodpecker, Red-shafted Flicker, Hammond's and Wright's Flycatcher, Black-headed Grosbeak and many more.

The Eastern fauna is comparatively homogeneous across the continent in a diagonal direction from the Atlantic coast to Alaska, with but slight variation in physical aspect, except in the prairie region of the central west. It is a country of low, even topography with good rainfall and covered with a uniform forest of little variety except such as is due to latitude and zonal distribution, but into it project the upper limits of the Great Plains characterized by great dryness, near-desert conditions and almost an entire absence of trees. This penetrates the moist continental fauna as a semicircular extension of the Transition Zone, its chord on the international boundary extending from the eastern Manitoban line to the mountains and north to Edmonton and Prince Albert.

The general tendency of this prairie fauna is towards small size and pale bleached colouration. Such species as are characteristic of it are those like the Prong-Horn Antelope, Bison, Coyote, Gopher, Prairie Chicken, Sage Hen, Burrowing Owl, Leconte's Sparrow, and Lark Bunting whose open country requirements debar them from wooded land. The remainder of its fauna is similar to that of the eastern country but generally sub-specifically differentiated from it through the drier climate and desert-like conditions. Some species that can be exampled under this division are Western Horned Owl, Say's Phoebe, Desert Horned Lark, Pale Goldfinch, Western Clay-coloured Sparrow, Dacotah Song Sparrow, Prairie Marsh Wren, etc.

The true Eastern Fauna, though generally similar from the far northwest to the Atlantic coast, does show a slight tendency to variation north of these plains, but the influence is slight and in broad treatment can be disregarded. Many species extend unmodified throughout the area, or when modification occurs it can usually be attributed to either thermal differences or the influence of the closely allied neighbouring prairie forms it comes into contact with in migration or on its edges. In general,

Photo, Harlan I. Smith Figure 3

MOOSE IN THE ROCKY MTS. PARK—BANFF

Photo, P. A. Taverner Figure 4

CANADA PORCUPINE

Photo, P. A. Taverner Figure 5

CHIPMUNK

Photo, P. A. Taverner Figure 6

AMERICAN SPARROW HAWK

(Female)

most of the subspecific forms mentioned as prairie or western are represented by type subspecies in this great eastern fauna, which is perhaps the typical fauna of Canada and which gives distinctive character to our biotal resources.

GEOLOGY OF THE CANADIAN ROCKY MOUNTAINS

By John A. Allan

The main object of this paper is to briefly outline the geological history of the Rocky Mountains, the prominent physiographical and structural features apparent to the mountaineer or to the railway-bound traveller, and, furthermore, to point out the influence which the rock structure has had in producing the present variety of sculpturing exposed in the various ranges of this great mountainous unit.

Not only do the topographic forms in the Rocky Mountains differ from those in the Selkirks and still more widely from those in the Coast ranges, but within the system itself, the erosion forms in the front ranges differ from those in the watershed range. The interpretation of this variety of the topographic forms necessitates a study of the structure and lithological composition of the rocks making up these mountains, as well as a consideration of the effect of glacial erosion.

The Rocky Mountain system forms the most easterly member of the Canadian Cordillera, sharply defined on the east by the foothills of the great plains in Alberta, and on the west by the long narrow intermontane depression, which has been called the Rocky Mountain trench. This system has an average width of sixty to sixty-five miles and follows a trend of N. 35 deg. W. The strike is roughly sub-parallel to the western side of the continent, which was defined by the position of the western protaxis as far back as Pre-Cambrian times. This mountainous unit is made up of a number of parallel ranges and ridges which in a general way lie *en échelon*, the more northerly segment being situated slightly west of the one to the south.

The ruggedness of the topography varies in different latitudes and, although the highest point is found in Pikes Peak, Colorado (14,147 ft.), yet the most highly sculptured ridges and ranges occur between the Crows Nest pass and the Mt. Robson district. The average elevation of the summits of these ranges between these limits is about 10,200 feet. Mt. Robson, the highest peak north of the 49th parallel of latitude, attains an altitude of approximately 13,000 feet.

Mention has been made of the sharply defined lateral limits of the Rocky Mountains. On the west the graben-like depression, known as the Rocky Mountain trench, forms as a most prominent orographic feature in the whole Canadian Cordillera. Extending from the International Boundary northwest into the Yukon, a distance of approximately 1,000 miles, this intermont depression varies in width from two to fifteen miles, and is in part occupied by the Kootenay, Columbia, Canoe, Fraser, Parsnip, Findlay, Kachika, Frances and Pelly rivers. In some portions of this trough the structure is that of a down-faulted block of rock between two major fault lines, a graben; such is the case where it is occupied by the Columbia and Kootenay rivers. In other places the depression has been carved out by various erosion agencies along a major fault line, which has rendered the rocks less resistant to erosion. The valleys of the Parsnip and Findlay are formed on this structure.

The line of demarcation between the prairies and the mountains is even more pronounced between latitudes 49 deg. and 52 deg. than the westerly limit of this mountainous system. The prominent escarpment, 2,500 to 3,000 feet high, in places almost perpendicular and composed largely of massive bedded gray limestone strata, sharply defines the mountainous topography from the rounded-topped ridges, for the most part covered with vegetation, that form the inner foothills.

This topographic feature is the result of overthrusting,

which occurred during the period of mountain building. The more massive rocks of the west were thrust in a northeasterly direction over the softer strata forming the understructure of the plains. At certain places along the base of this escarpment the plane along which the faulting occurred is exposed, and is generally known as the Lewis overthrust.

North of the Athabaska river this front escarpment is not so marked because the extent of overthrusting was not so great, the faults having been replaced to a certain degree by folds.

The rocks constituting this mountain system are for the most part of sedimentary origin, deposited in a sea, sometimes deep, sometimes shallow, as evidenced by the presence of casts of salt crystals in certain strata, and of ripple marks and sun cracks in other horizons. Conditions were suitable for the accumulation of sediments in the area now occupied by these mountains for a very long period. In age, the formations range from the upper part of the Proterozoic era, through the entire Paleozoic and much of the Mesozoic eras.

Igneous rocks have not been found north of Kicking Horse pass. In the Ice River valley, south of Field, there occurs a laccolithic mass of alkaline igneous rock covering about twelve square miles. The writer has described the geology of this intrusive mass in "The Geology of the Field Map Area, Mem. 55, Geol. Survey Canada."

The only other occurrence of igneous rock in this area is in the vicinity of Crows Nest pass. Here certain volcanic tuffs and breccias have a local distribution.

A structure section across the Rocky Mountains near the Bow and Kicking Horse valleys shows that the sedimentary formations are approximately ten miles in thickness. A similar section is exposed along the Athabaska and Fraser valleys.

Along the main line of the Canadian Pacific railway the section shows that the Pre-Cambrian rocks have a thickness of over 5,900 feet, and are exposed largely along the Bow valley above Castle station. The Paleozoic sediments are over 41,000 feet thick, and the Mesozoic upwards of 5,800 feet thick. The Paleozoic series contains one of the thickest Cambrian sections yet measured in the world, being approximately 18,500 feet. The limestones which form pronounced escarpments throughout the eastern slope are chiefly of Devonian or Carboniferous age.

Details of this section have been given by the writer in the memoir referred to above, and also in the International Geological Congress Guide Book, No. 8, part 2, page 168.

The youngest sedimentary formation within the Rocky Mountains is the lower Cretaceous, which includes the productive coal measures of the Kootenay formation. This is the oldest coal-bearing formation in western Canada.

During the closing stages of the Proterozoic era, represented by the Pre-Cambrian sediments, and during almost the entire Paleozoic era, a sea varying in depth from time to time occupied the Rocky Mountain geosynclinal basin and extended eastward over the present foothill area, at times probably extending to the Laurentian shield just west of Hudson Bay. The western shore line of this epicontinental sea lay along the axis of the Selkirks and the Cariboo mountains. From this western terrane most of the sediment was derived which makes up the Paleozoic strata within the Rocky Mountains.

The lithological character of the lower Paleozoic strata suggests that this sea was affected by broad uplifts and subsidence, causing a shallowing and deepening of the water, but in every case the beds were left in much the same positions as they were originally deposited.

However, during the late Carboniferous period the sea floor of the eastern geosyncline began to rise, and the western shore line receded towards the east. It was not until the close of lower Cretaceous epoch that the greater part of the area now occupied by this system of mountains appeared as land for the first time. Throughout most of the Mesozoic era shallow water conditions continued along the eastern half of the present Rocky Mountains and over varying areas on the plains to the east. During certain stages in the Cretaceous period extensive swamps and shallow bogs and lakes existed. In and about these a luxuriant vegetation flourished which later became compressed and transformed into the Cretaceous coal beds of Alberta. In central Alberta especially, such swamp conditions attracted the animal life of the period, which was represented largely by the land reptiles (the dinosaurians) and the turtles. Many of these animals became entrapped in the swamps and their bones later became petrified, hence the source of Alberta dinosaur beds exposed by recent erosion along the Red Deer river and other rivers in southern Alberta.

Towards the close of the Cretaceous there came a time when the stresses from the deep seated forces became so great that the rocky crust began to move. These stresses are believed to have come from the west and moved towards the east. The rocks in the substructure of the plains remained immovable, with the result that as the stresses accumulated, relief was found by the folding of the strata. As the pressure continued, the folds became closed and overturned toward the east. Later the strata broke along the lines of least resistance and the rocks on the west side of the fault were pushed upwards and thrust over the rocks on the east side. The more massive bedded limestones of the mountains were shoved over the rocks of the plains, producing an overthrust fault which is generally known as the Lewis overthrust. These mountain limestones, being more resistant to erosion,

Photo, John A. Allan Figure 1

FRONT ESCARPMENT OF THE ROCKY MOUNTAINS

The Devonian Limestones are thrust over the Cretaceous Formations

Photo, John A. Allan Figure 2

MONOCLINAL BLOCK STRUCTURE SEEN IN MT. RUNDLE AT BANFF

form an escarpment overlooking the plains. In this manner the prominent escarpment defining the eastern limit of the Rocky Mountains was formed. Similar structure is found in succeeding ridges west of the Front range.

The ridges consist of westerly dipping fault blocks which in many instances have a steep escarpment on the east and a more gentle dip slope on the west. This is caused by the more westerly block having been shoved over the one to the east. It is common to find in these ridges the older formation lying on much younger beds which have been over-ridden during the process of mountain building. In certain places in these mountains the Carboniferous, Devonian or even the Cambrian strata are found overlying the lower Cretaceous beds which are much younger and also less resistant to erosion. In Cascade mountain at Banff the Devonian beds are thrust over the Kootenay coal measure. In Roche Miette on the Athabaska the Cambrian beds overlie the Cretaceous.

In places along the fault lines streams have eroded through the overthrust mass, leaving isolated or partially disconnected outliers of the overthrust block away from the range to which they belong. Crows Nest mountain in the pass by the same name is a good example of such an outlier. Here the Devonian limestones are lying on the Cretaceous shales. Folding mountain at Brulé lake, west of Edmonton, is another example, but here erosion has not yet completely disconnected this mass from the ridge to which it belongs.

This first great uplift that occurred at the close of the Mesozoic and which formed the Rocky Mountains, is known as the Laramide Revolution. It is not possible to estimate the exact amount of uplift as a result of this orogenic movement, but taking into consideration the thickness of the sedimentary series that was uplifted, the Mesozoic sea floor must have been raised over three miles above its original altitude. This upward movement was

not a rapid one, but probably extended far into the Tertiary period.

It has not been possible to measure the actual amount of overthrusting, but Mr. McConnell has estimated that the Front range at Kananaskis has been thrust seven miles over the plains. Just south of the International Boundary line, the Lewis overthrust has been estimated to be at least fifteen miles.

The amount of shortening of the earth's surface in that segment now occupied by the Rocky Mountain system that has resulted from folding, faulting and overthrusting, is difficult to measure, but in some places it has been thirty miles and in others possibly as much as forty miles. That is to say, if the formations could be drawn back into their original positions the Rocky Mountain area would be thirty to forty miles wider than it is to-day.

These mountains can be readily subdivided into two parts, of which the eastern is the younger. The western division is the older and is made up of rock formations from Pre-Cambrian to Silurian in age. The ranges are irregular and have been eroded from strata gently folded or lying more or less horizontal.

The dividing range of the system, which is here also the continental watershed range, typically represents the older portion of the mountain system. The rocks in the eastern division are largely Devonian to lower Cretaceous in age. These formations have become faulted and overthrust into a series of monoclinal blocks, which have, in most ranges, a steep slope towards the east, and a more gentle slope towards the west.

Let us now consider briefly the development of the present drainage systems. Accompanying the initial stage of uplift, a system of *consequent* streams was developed transverse to the major axis of the uplifted area. As the Laramide uplift continued, many of these transverse streams with increased velocities were able to cut their courses across the gradually rising ranges

and smaller folds of the foothills. These streams are antecedent to the structure in that they were there before the ranges were formed. Examples of these *antecedent* streams are the Athabaska, Peace, Saskatchewan, Bow, Kicking Horse, Oldman and a few others.

In the troughs between the parallel ridges, on the softer infolded Mesozoic beds, a longitudinal system of streams was developed, and therefore much younger than the transverse streams. These are called *subsequent* streams because the course followed is marked by a structural break or zone of rock less resistant to erosion. This system of subsequent drainage is noticeable throughout the eastern slope. Such valleys as the Spray, Cascade, Sundance, Forty Mile, tributary to the Bow, or Moose, Fiddle, Rocky or Maligne valleys tributary to the Athabaska, are examples.

The V-shaped valleys of both the transverse and subsequent systems of drainage had become deeply incised in this uplifted area before the opening of the Pleistocene epoch, or the glacial period. Snowfields enlarged and valley glaciers moved down and formed the trunk glaciers in the transverse valleys. By glacial gouging and plucking, the V-shaped valleys became modified into the U-shaped ones. The present glaciers along the watershed range and on the west slope are only miniature remnants of the earlier ice sheet that filled many of the valleys and covered many of the ranges. The work accomplished by the glaciers is still eminent and adds beauty to the scenery. Besides giving gracefully rounded curves to the valley sides, the glaciers eroded into the lateral depressions along the valley or range, and formed basins or cirques many of which enclose lakes.

Glaciers have been the cause of the formation of most of the lakes within the mountains. Three prominent types might be mentioned. Those occupying rock basins carved out by glacial action such as lake Agnes at

Laggan, Turquoise and Margaret in the Upper Bow, lake Magog at Mt. Assiniboine, and Berg lake at Mt. Robson.

Such lakes as Moraine, Louise, Minnewanka, Kinney, Maligne, Pyramid and Waterton occupy basins formed behind morainal detritus. A third type of glacial lake is represented by such as Hector, Bow, Emerald, Gloria and Marvel. The barrier in this case consists of the outwash of gravel, and sand from the front of the ice. Other types of barrier lakes can be found in this area but these cannot be mentioned here.

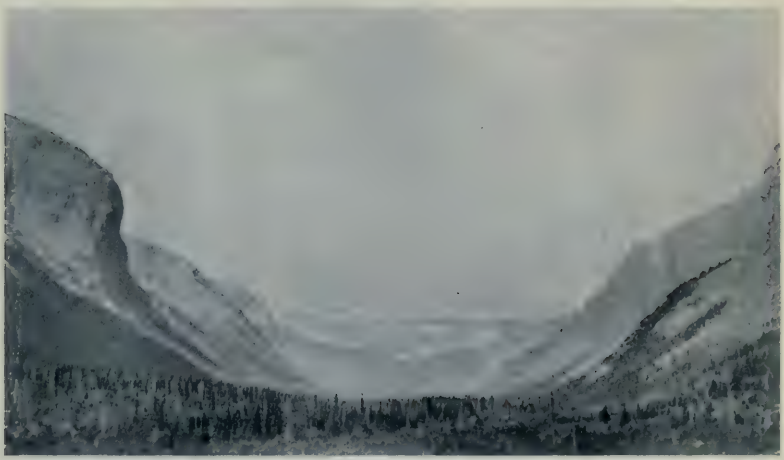
The topography of at least the major trunk valleys, such as the Athabaska, Fraser, Saskatchewan, Bow and Kicking Horse have been greatly modified by the morainal debris left by the disappearing valley glaciers. In many cases the outlets of these valleys became blocked and in the lakes formed behind these barriers, gravels, sands and clays were deposited. These deposits are exposed in the terraces along the sides of many of the larger valleys.

In some of the smaller tributary valleys the rock waste from the ice occurs as lateral moraines, forming ridges that run lengthwise along the valley, and also as terminal moraines that form transverse ridges.

The influence which the rock structure has had upon the present scenery in the Rocky Mountains is so marked that brief mention must be made of it here. The type of sculpturing produced by weathering depends on the composition of the rock and also on the existing structure.

Seven distinct types of mountains can be recognized in this area.

1. Mountains composed of horizontal strata tend to weather into the pyramid forms, usually broadbased, sloping regularly to the apex. The slopes depend on the character and thickness of the composing strata. Ex-



Photo, John A. Allan Figure 3

THE DEVIL'S GAP

Typical U-shaped Depression Developed and Modified by Glacial Action

Photo, John A. Allan Figure 4

MT. MOLAR

Showing resistant Cambrian Limestone underlain by less resistant shale formation

amples are formed principally along the watershed range, such as Robson, Pyramid, Geikie, Forbes, Lyell, Temple, Deltaform and Assiniboine.

2. In slightly inclined strata the pyramid outline is slightly lopsided, as seen in the Aylmer, Goodsir, Ball, Balfour or Crows Nest.

3. When the strata is moderately inclined the block type of mountain is produced, as in Rundle, Cascade, Roche Miette and many peaks in the first three ranges of the Rocky Mountains.

4. In vertical or steeply dipping strata, mountains like Edith, Hole-in-the-Wall or Spike Peak are produced.

5. Anticlinal mountains are rare, as up-arched strata soon become incised and eroded along the central axis. Knobs like Stoney Squaw at the south end of Cascade mountain illustrate this type rather poorly.

6. Synclinal mountains are common and indicate mature erosion, since the syncline at one time occupied the trough between up-arched masses of rock. Folding mountain, President range, Castle Mountain range, and the range in which Mt. Molar and Mt. Hector are situated give examples of this type.

7. When thick beds of resistant rock are interbedded with less durable strata, "weather terraces" are formed, as seen in Amiskwi peak, Pilot, Redoubt, and also in Mt. Molar. This last type is closely related to those mountains which belong to either the first or second classes.

MOTION OF THE YOHO GLACIER 1914-1916

By Arthur O. Wheeler

Unfortunately, it was found impossible to continue the yearly measurements of the Yoho Glacier in 1915, and it was not until the 24th of July, 1916, that they were resumed.

On August 6th, 1914, four metal plates had been placed in line, at approximately even intervals, across the more level portion of the ice forefoot of the glacier that had been used for such purpose since the inauguration of the series of observations. A careful search was made for the plates, but not one of them could be found.

Rate of Flow

Owing to the continual recession of the forefoot, amounting in ten years to 321 feet, the line of the plates was getting dangerously close to the great crevasses that open up at the terminal point of the glacier and extend inward. The result was that on looking for the plates none could be seen, and it could only be surmised that they had fallen into recently opened crevasses intersecting the line of their movement.

In consequence, it was impossible to get any data for the rate of flow of the ice that had occurred since the observations in 1914, when the plates were reset in line, and it was necessary to now start afresh.

Expecting some such happening, four other plates had been brought and these were duly placed in position on the line between the north end of the measuring base, on the mountain slopes east of the ice, and the white stone in the face of the cliff on the west side that had always been used heretofore. Angles were read from the south

end of the base, sighting upon the north end and each of the plates in order, and they were thus fixed in position.

For Advance or Retreat

The usual measurements were made from Rocks Nos. 1 and 2 on the left side of the stream and from the Sherzer Rock on the right side. The results are set forth in the following table:

Table Showing Measurements to Nearest Ice

Year	From Rock No. 1 Left Side of Stream	From Rock No. 2 Left Side of Stream	From Sherzer Rock Right Side of Stream
1914	277.6 ft.	313.0 ft.	222.7 ft.
1916	413.0 ft.	449.0 ft.	247.0 ft.

1914-1916 Average Retreat of Ice Forefoot—98.6 ft.

Annual Change in Formation of Ice Forefoot

In accordance with the practice of other years, photographs were taken from Station E, situated where the trail comes out of the forest on to the moraine, and from Rocks Nos. 1 and 2 on the left side of the stream (see map opposite page 274, Canadian Alpine Journal, 1908, Vol. 1, No. 2).

The view from Station E (Illustration No. 1) shows a very marked flattening of the forefoot and a striking recession on the eastern side; examination shows that the body of the ice forefoot has become much narrower and that a correspondingly wider expanse of bed-rock is exposed.

The ascent of the forefoot was a simple matter, necessitating very little step-cutting where, in previous years, quite a bit of step-cutting had to be done; Illustration No. 2 shows the forefoot in profile. On the opposite side, the eastern one, it was now impossible to cross the canyon of the stream from the glacier between Mts. Balfour and Gordon by the old route, where ice-bridges had spanned it, and it was necessary to descend to near

the extreme end of the forefoot, again a very simple matter, as the slope was an easy grade where before there had been great ice-cliffs. All the eastern edge of the ice was covered by rock debris and mud.

The beautifully arched ice cave, for which this glacier has always been remarkable, was absent and the extremity of the forefoot seemed hardly thick enough to produce it. A comparison of Illustration No. 1 accompanying this report with Illustration No. 4, opposite page 56 of the Canadian Alpine Journal, 1913, Vol. 5, will give a good realization of the remarkable shrinkage that has taken place. Again, if Illustration No. 2 be compared with Illustration No. 1, opposite page 54 of the 1913 Journal, it will be clearly apparent how greatly the mass of the forefoot has decreased in volume and how the rock bed on which it rests is being gradually uncovered by the retreat of the ice.

It is much to be regretted that this, heretofore, most attractive feature of the many scenic attractions of the Yoho Valley, should have lost so much of its spectacular beauty in the form of its magnificently-arched ice cave, and it is to be hoped that it has not gone for all time. The spring season of 1916 was fully a month later than usual and this lateness carried throughout the summer, so that the cave formation, which generally appears during the latter half of July, may have been formed in August. The cave is due to the action of the stream from the Balfour-Gordon Glacier which, entering from the northeast, passes under the forefoot of the Yoho Glacier; but its course is now so close to the eastern edge of the ice that it will not be very many years until, at the present rate of recession, the ice will have ceased to cover this portion of the bed of the stream.

Photo, A. O. Wheeler

ILLUSTRATION No. 1
Ice Forefoot of Yoho Glacier from Station E

Photo, A. O. Wheeler

ILLUSTRATION No. 2
From View Point 79.3 feet South of Rock No. 1—1916

MISCELLANEOUS SECTION

THE GARIBALDI DISTRICT

By C. Chapman

The British Columbia Mountaineering Club has made several attempts to have a Government Reservation established over a certain mountain district within easy reach of Vancouver. Our efforts with the late government were unsuccessful and we are now taking steps to place the matter before the present administration.

The district proposed to be reserved lies at the head of Howe Sound, and is easy to reach now that the Pacific Great Eastern Railway is in operation. A journey has actually been made from Vancouver into the heart of the district and back again in two days. A trip like that does not, of course, give much time to appreciate the change from city life, but two such days may make a big difference in the life of a busy man.

I do not for a moment wish to belittle the importance of those local week-end climbs and campings above the two thousand foot line which confer such unmeasured benefit upon all those who take them. The physical and mental value of the weekly climb on Grouse Mountain and the nearby hills cannot be over-emphasized. But the case is a little different as regards the proposed Garibaldi Park, with its wide solitudes, its snowy plateaus, and numerous glaciers. The stimulus, both physical and mental, which belongs to an alpine district, is altogether different from that afforded by the mountains which we of Vancouver see from our northern windows. The air is more bracing in a marked degree, and the variety and interest of the landscape are immensely greater. To

analyse these effects would require a Ruskin, and some of the most striking passages in Ruskin's writings are analyses of just these aspects of mountaineering among lofty summits and glacial scenes.

To those who have to make intense mental exertion for certain periods, whether learned professors, or captains of industry or responsible statesmen, there is nothing (not even angling) to take the place of climbing among the eternal snows. We shall have many such men in Vancouver and Victoria in the future; men on whose health and strength the country will have to depend; and to all these the neighbourhood of Garibaldi Park will be a priceless boon.

The proposed park comprises some 300 square miles, being all that portion having a greater elevation than 3,000 feet above sea level in the area bounded by the Mamquam and Pitt Rivers, and by the main stream and east branch of the Cheakamus River.

The dominating peak of the district is Mount Garibaldi, a volcanic cone having an elevation of 8,700 feet. It is a striking object even when viewed from the Squamish Pier, whether seen in its usual form of a snowy peak or, as it sometimes appears, as a huge ash-coloured pyramid. It is believed to be the highest mountain of the Park, and around it centres a wonderful variety of scenic beauty.

Garibaldi presents the variety of rocks which belongs to all volcanic mountains. It can be climbed from the north up a steep snow slope and an arête rising above the Warren Glacier, but is more easily approached from the south side by following the long black ridge, known as Round Mountain, and thence up a long snow slope to the saddle, whence the peak is soon reached. There are, as a matter of fact, two peaks, the southern being called the Pinnacle and the northern the Peak. Local mountaineers have not yet settled which is the higher. At least six glaciers hang on all sides of the mountain and

extend well below the timber line. They have been named the Garibaldi, Lava, Pyramid, Pitt, Sentinel and Warren Glaciers.

Columnar Mountain is one of the smaller peaks on the south side of Garibaldi. It is dwarfed by its big neighbour but is close on 7,000 feet high. It is composed almost entirely of basaltic lava, split into nearly regular columns, and presents one of the striking geological features of the district.

East of Garibaldi lies Mount Mamquam, which may be reached by crossing Lava Glacier diagonally to its eastern edge, passing on the way Rampart Lake, a remarkable sheet of water which deserves some special mention. This lake is enclosed between a low crescentic rim of rock and the glacier, which, flowing across the horns of the crescent, forms the western boundary of the lake. The icy walls rise abruptly from the water to a height of about twenty-five feet, forming a natural dam. The ordinary way of escape must be underneath the glacier, but there are traces of a high-level channel over the rock on the eastern side.

The first recorded ascent of Mount Mamquam was made in 1911, and our first glimpse of the vast snowfield at the top almost justified the remark of our leading man that it was "as big as England." The highest peak is on the southwestern edge of the snowfield and we had a three-mile trip across to reach it. The aneroid there registered 8,400 feet.

It is the southern part which contains the two highest peaks of the district, but it has no extensive meadows suitable for camping. A little farther north, however, there is room to spare. It was during our trips up Garibaldi and Mamquam that the idea was conceived of holding the next camp on the other side of Garibaldi Lake. As viewed from Copper Peak, the land at the lower end of the lake seemed to drop suddenly into the

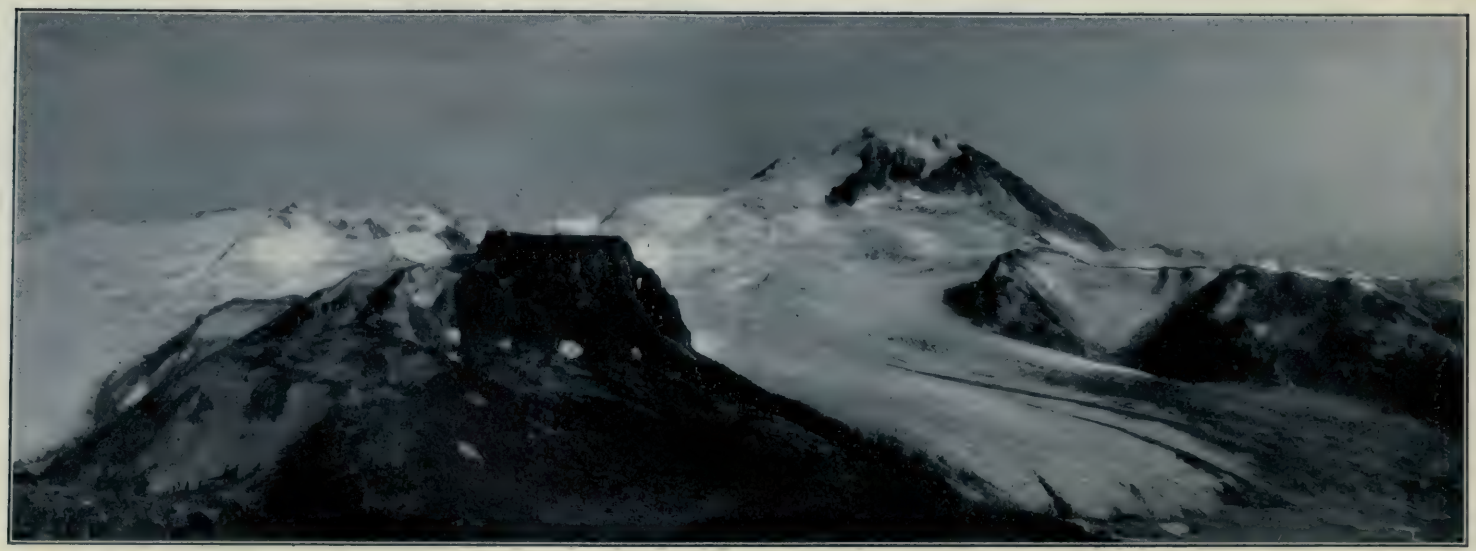
Cheakamus Valley and to offer a good route by which the lake could be reached. Such proved to be the case, and in 1912 a camping place was selected on some broad meadows running in the form of a terrace for over a mile along the southern slope of Black Tusk Ridge at an average elevation of 5,000 feet above sea level and 400 feet above Garibaldi Lake. The Black Tusk Meadows, as they have been named, are the finest of their kind and are in a very convenient position for a mountain camp.

The Black Tusk itself, with an altitude of 7,350 feet, is one of the most remarkable features near the camp, and from its shape can always be recognized, no matter from which side it is viewed. The Tusk is composed of basalt jointed so closely and completely as to divide it into irregular columns, so loose in places that they can be moved by hand. It is almost a puzzle how the sides of the Tusk can stand at so steep an angle. Viewed from below, they appear to rise almost vertically, but closer inspection shows numerous steep gullies which afford easy access to the summit.

The base of the Black Tusk is a favourite exercising ground for goats. Marmots and ptarmigan, however, constitute the chief wild life of the district. An occasional bear or wolf is seen, but they soon get wind of man's presence and give us a wide berth.

Castle Towers Peak (8,000 feet) was the highest peak near the camp and made a very good day's climb, the journey being made by way of Helmet Glacier and thence up a long ridge. The Castle Towers Glacier is very heavily crevassed. Helmet Glacier is interesting because of distinct ice currents observable in the lower part.

Adjoining Castle Towers by way of the Battlements and only a little lower than the Towers in altitude is Copper Peak. This was first approached by us from the south, and it was from this peak that the first clear view was obtained by our Club down the Sphinx Glacier to



Photo, W. J. Gray

THE TABLE, WARREN GLACIER, AND MT. GARIBALDI FROM RED MOUNTAIN

Garibaldi Lake and the Meadows which induced them to change their camping ground.

Garibaldi Lake is one of the most interesting features of the district. It is three and a half miles long by two miles wide and is surrounded by peaks and glaciers in great variety. The most remarkable geological observation made by the Club was probably the manner in which Garibaldi Lake is drained by percolation through the Barrier, a precipitous bluff 4,500 feet high, into Stoney Creek. The Barrier itself presents a good vertical section of the lava bed which covers a large portion of the country south and west of Garibaldi Lake. Its position with regard to Stoney Creek suggests that the lava flowed down from the vicinity of Mount Garibaldi and formed a dam in the upper part of the valley, thus completing the basin in which Garibaldi Lake lies. The trip around the lake can be made in twelve hours and is one of great interest.

During the 1913 camp of the Club, a raft was built and some of the members crossed the lake after four hours hard paddling. At a distance of a quarter of a mile from shore an attempt was made to sound the depth of the water, but no bottom was found at two hundred feet, which was the limit of our alpine ropes. On this occasion the party essayed to climb the Table, a structure of basaltic rock with loose columnar jointing like the Tusk, but having a remarkably flat top like the "mesas" of Arizona and Mexico. Owing to the dangerously loose structure of the rocks, this attempt and the next failed and it was not until last year that one of our members made the first ascent. The summit was found to be perfectly flat, with an area of about 400 feet by 150 feet, and covered with heather and stunted trees. This level surface breaks away in perpendicular walls of rock varying from 300 to 1,000 feet in height.

No account of this region is complete without a reference to its wealth of blossoms. The Black Tusk

Meadows and the ridges adjoining the glaciers and snowfields are rich botanical areas belonging to the Arctic and sub-Arctic zones, noted, as is usual with the flowers of the higher regions, for their bright, sharp colours and complete absence of perfume.

The alpine phlox (Phlox Douglasii) is found in great profusion, as are the mountain anemone (Anemone occidentalis) with its beautiful cream-coloured flowers and the Bryanthus glanduliflorus, commonly called white heather. The little Saxifrage, with its pink and white blossoms, grows in dense, compact masses, and follows the retreating snow very closely. The Moss Campion (Silene acaulis), too, with its beautiful carpet of pink flowers, displays a degree of hardiness which can scarcely be appreciated by those unfamiliar with the life of the mountain flowers. Then there is the Polemonium confertum, sometimes called Jacob's Ladder, one of the rarest of alpine treasures and beyond comparison for its blue colour with anything in the floral world. The blue lupins are found in great masses, and their artistic effect seemed to be appreciated even by our pack horses, who refused to be moved from them. And there are Erythroniums, and Indian Paintbrushes, and a host of others too numerous to mention.

The preservation of the Garibaldi region as a National Park will give Vancouver another attraction for the tourist. If a road were built from Daisy Lake to the Black Tusk Meadows the district would be as easy to reach as the Rainier National Park. It lacks nothing which that park possesses except elevation of the main peak. Many private individuals, other than members of our Club, have visited the district and all are unanimous in its praise. Garibaldi Lake has been favourably compared with the far-famed Lake Louise, and has the added merit of being within a $5.00 train ride. Banff is a long way from Vancouver and a great many people unfortunately never get any nearer to the mountains

than is permitted by a seat in a railway carriage as they go through the Rockies. Strathcona Park is almost as costly to visit and is as remote as the Yukon to most of the citizens of Vancouver and the neighbouring cities.

Here, however, we have the opportunity of creating a resort full of interest to every man who has the slightest eye for nature, to which the overworked and over-worried can go in the full certainty of being restored to healthy vigour. If our government does not recognize the value of the district soon, it is probable that some of the syndicates which are always on the lookout for such things will discover it and make arrangements to exploit it for their own benefit. It seems to us that now is the time to arrange for its protection.

IN MEMORIAM

CAPT. A. FELIX WEDGWOOD
5th North Staffordshire Regt.

"Killed in Action, 14th March, 1917." A short epitaph, but is there anywhere a finer one? After Waterloo the stonemasons kept tablets in stock with the motto "*dulce et decorum est pro patria mori.*" To-day we have more heroes and our feelings are more restrained.

We first knew Captain Wedgwood—not a Captain then—in the summer of 1910. In the early summer he came to the Banff Club House, with an introduction from Toronto, wishing to become a member of the Club and to see something of Canadian climbing. He had already done some mountaineering in the Alps and had made a recent attack on Aconcagua, but was frostbitten before he reached the top. He made the ascent of Torlosa.

From Banff, in company with Dr. Hickson, he journeyed to Mt. Assiniboine. Bad weather prevented an attack on the peak, but gained him a wife. He met, in camp with her brother, Dr. T. G. Longstaff, the well known Himalayan explorer, Miss K. Longstaff, the daughter of Col. Longstaff, of Wimbledon, and the marriage was celebrated the following year.

He was with the Club during the Camp in Consolation Valley, making several ascents, after which he made a successful attempt on Mt. Assiniboine and also Hungabee. He stayed at Glacier and made several ascents there, going on to the Pacific Coast, where he climbed Mt. Garibaldi—a fine mountain only now coming into its own. He returned to England in the autumn and, while always hoping to return to Canada, never succeeded.

He was born in 1877, the son of the late Clement Wedgwood and Emily Catherine, sister of Lord Rendel. He was descended directly from Josiah Wedgwood, the great potter. Educated at Clifton and Trinity College, Cambridge, he became a civil engineer. He had a great love of travel and climbing appealed strongly to him.

In 1910 he published his well-known novel "The Shadow of a Titan," which deals largely with South America.

When the war broke out he rejoined his Territorial Regiment as Lieutenant. He was wounded at Hill 60 (Ypres) in July, 1915, promoted Captain in August, 1916, and fell in attacking Bucquoy. He lies in the British cemetery of Rossignol Wood, not far from the field of action.

He leaves to his daughters, and a son whom he never saw, a heritage of honour and an example not to be forgotten. To his wife, herself a well known member, and to his young children, the Club extends its fullest sympathy. S. H. M.

HARLEY H. PROUTY

Among the keenest and best mountaineers sent us by the United States was Harley H. Prouty. He came to the Cathedral Camp of

CAPT. A. F. WEDGWOOD
Killed in action 14th March, 1917

1913 as a representative of the Mazamas, of Portland, and was fascinated by the Canadian Rockies. From this Camp he made the ascents of Mt. Odaray and Mt. Huber, the latter by the rock route, one only suited to experienced climbers. From the Cathedral Camp he proceeded to that at Mt. Robson Pass, whence he made the ascents of Mt. Lynx and Mt. Resplendent. With B. S. Darling and the guide, Walter Schauffelberger, he made the first attempt on Mt. Robson by the West Arête. The party reached within four hundred feet of the top, but bad weather prevented the complete ascent. A full account of the climb is given in the Canadian Alpine Journal for 1914-15. Prouty always hoped to come back to the magnificent Robson neighbourhood and achieve the peak, but it was not to be. He died in St. Vincent's Hospital, in Portland, on September 11, 1916, aged 59.

He came of an old New England family, whose records date back to 1667. For many years he was in the lumber business, but retired about ten years ago and spent much of his time gratifying his taste for travel.

Exceedingly reserved, he was greatly liked by all who came to know him. He was of the best type of mountaineer, enthusiastic, clear-headed and unselfish.

S. HARPER GRAY, D.D.

The number of our original members grows smaller. On August 15th, 1917, Dr. Gray passed away in Toronto after an illness of some two months. He was born in Kingston in 1873 and took his Arts Course at Queen's University. He completed his Theological Course at Knox College in 1898, whence he proceeded to Banff. There the mountains cast their spell on him, a spell that is never broken.

His most interesting climb was the first ascent of Mt. Hermit in the Selkirks, which he made in the company of the late Dr. Herdman and Major A. C. Gordon, M.C., who is now "Somewhere in France." A detailed account of the climb, written by Dr. Gray, appears in the first issue of the Canadian Alpine Journal. He also climbed Mt. Lefroy, but found the climb "not to be compared to the varied and exciting work on snow and rock which one meets with on Hermit."

He never managed to come to the Club Camps, but kept up his interest in the Club, and fully appreciated the value of the work it was doing for Canada.

At the time of his death Dr. Gray was minister of Old St. Andrew's Church, Toronto, where he had been some five years and where his work was greatly appreciated.

MAJOR W. F. GUILD
52nd Battalion, C.E.F.

Since the outbreak of this cruel war, we, as Alpiners, have been thrilled with the splendid deeds performed by our members. Again and again we have been compelled to add names and yet names to the long list of those who have made the supreme sacrifice while doing their duty on behalf of our beloved country, and now we must add the name of Brigade-Major W. F. Guild, who was killed in France on April 10th last.

Major Guild attended the 1914 Alpine Camp held in the Upper Yoho, and it was while in camp when he was battling with the dangers and difficulties of the great white giants that the first news of the world's war came to him. Then came the news that Canada was marshalling her manhood to take part in the great struggle. Guild immediately hastened to Winnipeg and identified himself with one of the training corps and qualified as lieutenant; later on he qualified as captain. Early in 1915 he joined the 52nd Battalion, and with that Battalion he went overseas. During September, 1916, he was wounded and sent home on furlough. In the early part of 1917 he again returned to France and was raised to the position of Brigade-Major, which position he only held for a few days before his death.

He was buried in the British cemetery at Barlin, France, and a suitable stone has been placed to mark his last resting place.

Major Guild was born at Kemnay, Manitoba, and received his early education at Brandon High School. From there he went to Manitoba University, where he won many scholarships, and graduated from Manitoba College in the famous class of 1909. He was not by any means an academic recluse or scholarship man only, but took an active part in every department of University life; he played on the senior football team during his entire University course and was captain in his final year. He was also President of the Literary Society, and had a wide reputation as an inter-collegiate debator. Having graduated from the University, he became a student-of-law in Winnipeg, and after completing a brilliant course he was called to the Bar in 1913. After graduation he entered the firm of Messrs. Campbell, Pitblado & Company, of that city, with which firm he was connected at the time his country called him to do battle in her cause.

Broad in his outlook of life, enthusiastic and ambitious to accomplish life's mission he spent his time in effort that would accomplish this end, yet when the call came to the young manhood of Canada to go to the front Major Guild was the first to respond and answered "O Canada we stand on guard for Thee." The spirit which he carried with him into battle was not one of adventure but a deep sense that he was fighting the battle for democracy and freedom. Not only does the Alpine Club lose a splendid and loyal member, but Canada has lost one of her noblest sons.

Although Major Guild has been called from us, yet the splendid example he always set must ever stimulate and inspire us to better and nobler living, and it may seem that his life has been cut off, yet we feel that his spirit will live in a nobler race of men yet to come.

A. S. Matheson.

SERGEANT SIDNEY J. UNWIN

Canadian Artillery

Still once again the Alpine Club of Canada must record a broken link in the Society's chain in the loss of one of its well-known members—Sergeant S. J. Unwin. "Sid," we who knew him best called him affectionately, and that name will recall his attractive characteristics to a large portion of our Club.

Sid became a member of the Canadian Alpine Club in 1908 through long association with every peak and valley of any note

MAJOR W. T. GUILD
Died of Wounds

between the Saskatchewan and Athabaska Rivers. It was through his grit and determination that Maligne Lake was so easily found in the summer of 1908, for it was he who made a record climb to a mountain later known as Mt. Unwin and there saw the lake lying a few miles east of him. There is probably no other man who has had the intimate knowledge of so vast an area of these hills as Sid, for he knew every crack and cranny between the two above-mentioned rivers, first through the long winters he spent in trapping and the shorter summers when he guided the would-be explorer or the climber into unknown ways. His resourcefulness under trying conditions, his patience and good nature at all times, his splendid bunch of horses, made a trip into the hills with Sid a pleasure that no one will ever forget who had the good fortune to be out with him. To enlarge upon his life *before* the summer of 1914, seems like repeating that which we all know so well, so I turn to the years which have followed.

Sid was in the heart of the hills when the call to arms came that fateful summer of 1914. On his return to Banff that fall, he quickly settled his business and enlisted with the 20th Battery under Col. Stewart, then stationed at Lethbridge. He was made Corporal and it was typical of the man that when later he was offered a commission he refused it, as he wished to get to the front as quickly as possible and the commission would have held him back for another draft.

In June of 1915 his battery was transferred to England; in January of 1916 it was sent to France. From that date Sid served the guns till the day on which he was wounded, May 3rd, 1917.

His letters invariably spoke of the mountains which he "often wondered if he would ever see again," and he always greeted photographs of the country he loved with great enthusiasm. He was a soldier in every spirit of the word. He never mentioned the hardships with which he must have been daily in contact but several times wrote not to send him the little comforts "for we have all a soldier could ask for," and to "send them to the boys in hospital." Then came the third of May and a telegram that he had been wounded. Eighteen days later came these words from him: "Well, Fritz got me at last. I have lost my right arm at the shoulder, am quite deaf from serving the guns, have numerous cuts on my head, a good many bruises, but otherwise I am fine and dandy." This was written with his left hand and was a true example of British pluck and spirit.

So many of us knew Sid and his clean, gentlemanly ways here, that the gap of our knowledge of his life after he crossed the seas may be easily filled by a letter which was written to his mother just after his accident and is as follows: "Dear Mrs. Unwin, I have to-day obtained your address from your other son, Gunner Unwin, and I wish to tell you how sorry the whole Battery is on account of losing Seargeant Unwin. No single man or officer in the whole battery would be so badly missed as he is by everyone and we are afraid that now he has lost his arm he may be unable to come back to us when his wound is healed.

"I can truly say he was the most efficient, reliable and dependable N.C.O. in this unit. I had him recently under me in charge of the wagon lines. He pined to get back to the guns however, and it so happened that we came back together. The day he was wounded

I happened to be in charge of the guns. He was doing some routine firing and had sent all his men away as the Battery was being shelled and he did all the loading and firing single-handed. He was not deterred from carrying on alone, although one of his ammunition pits was set on fire by a direct hit and some others very close.

"I was the only officer at the Battery at the time and I was so much pleased with, and admired his conduct, that I committed the circumstances to paper at once in case of accidents, so that if anything did happen to me, the paper would bear witness. In the evening, however, things having become quieter, he called back his limber gunner and together they were cleaning out the gun when a high explosive shell burst in the air above his gun and wounded both of them. Capt. Flexman attended to your son, while I did what I could for the other.

"I should have told you before this that Sergeant Unwin had extinguished the fire in his ammunition pit.

"I was very sorry to hear the next day that Sergeant Unwin had to have his arm taken off. I understand that except for this he is all right and have no doubt that he will be with you in a week or two.

"When you see your son, give him my kindest regards and best wishes and thank him for me for his invariable patience with a very trying officer.

"Yours very sincerely,

"E. K. Carmichael, Lieut."

Surely no comment is necessary on such words, every line rings with the truth even as we knew him here.

After he was wounded, he was sent to Leeds hospital and all his letters were bright and cheerful, always speaking of the hills and the trails for which he had always longed. But on the 30th of June came the telegram "Sid died suddenly this morning." At present it is all we know.

Thus has gone from us one of the most fearless, most lovable members of our Club, joining that great company whose places cannot be filled, whose places we would not have filled. They will live in our hearts till we too have passed beyond the hills.

MARY S. WARREN.

ALPINE CLUB NOTES

CONCERNING MT. MOLOCH

In the article contributed to Vol. VII of this Journal, pp. 33-47, the writer failed to correct a couple of slips on page 37. The word "northeast" on line 15 should read simply "north"; and it was, as I now understand from Mr. Wallace's instructive article in the same issue of the Journal, on a peak on the west and not on the north side of Moloch that we saw the rival party on the day previous to our attempt. The peak is named by Mr. Wallace "Baal," and his description of its relation to Moloch is very illuminating for one who, like myself, has not approached or had a view of the latter mountain from that side.

The question as to which is the better side for another attack on Moloch can scarcely be decided by one who has tried only the eastern and southeastern ridge. Against the fact that this route of approach is longer and lands you at the more risky part of the climbing after some fatiguing, though quite safe and not very difficult work, has to be set the drawback of an approach to the summit ridge of Moloch from Baal which, according to Mr. Wallace's description, consists in the entire lack of decent foot and hand-holds and the consequent danger entailed by a slip on the part of a climber where there is little or no opportunity afforded of belaying the rope. It seems clear that from whichever side the mountain is again attempted, it will be advisable for the climbing party to be provided with rope-soled shoes or their equivalent.

The main difficulty about Moloch is the fact that one cannot make a camp conveniently near to its base; hence a long march is necessitated, and this leaves too little time (on a day's trip) for the last part of the climb which will undoubtedly be slow work. The picture of the summit ridge (p. 40 of the article referred to) indicates this very clearly. The fact of six unsuccessful attempts having been made on the mountain has led to such an extravagant statement (not in the A.C.C. Journal) as that "it is an impregnable fortress." Given fine weather, a long day, favourable snow conditions and good average climbers, it will certainly be captured without extraordinary efforts. I have seen this happen with more difficult peaks in the Rockies, and, if only the amateur of the party had been in fair condition on the day of our attempt or the party had had sufficient provisions to permit of their resting a few days before renewing the attempt, I think there is little doubt that, ere this, the summit would have been heightened by a cairn.

J. W. A. Hickson.

MT. LONGSTAFF

In July and August, 1916, Professor Holway, with Dr. A. J. Gilmour and Mr. Howard Palmer, explored the region of Mt. Longstaff, going in by way of the Swiftcurrent River. Professor Holway writes:

"The valley ended in great cliffs 2,000 ft. high with the tongue of the glacier just showing at the top and the great stream falling through narrow places in the cliff, and then behind an ice pile 600-ft. high. With much effort a camp was made in a small grove on a level with the glacier tongue, a few feet from the edge of the precipice, with glorious views of Mt. Whitehorn and down the valley. There were waterfalls everywhere, several coming out of holes in the face of the cliffs, and high above camp a glacier discharged frequently. The ascent of Mt. Longstaff was made, also of a minor peak in the same range, and of the peak at the north end of the Whitehorn Range, a splendid glacier trip. Whitehorn Pass and a glacier pass south of Whitehorn were ascended, the latter leading down to Lake Kinney by an apparently easy route.

"It rained nearly every day. Getting up to the high camp, a log was placed across the river. It was there in the evening of the day before the party left, but gone when they came down. There had been a big fall of ice from the glacier, probably blocking the stream, for ice was found six miles down the river. The glacier was active, and much of the ice fell directly into the stream near the top, so that the water at the end of the valley was half ice. The party had to find a place where the river divided into three parts and wade the very rapid current filled with blocks of ice.

E. W. D. Holway.

MT. NORQUAY

Mr. Greenham sends a most interesting account of an ascent of Mt. Norquay at Banff, "the modest looking two-ridged mountain, between Stony Squaw and Mt. Edith."

The mass consists of two distinct wings connected by a very high and steep col at their northern ends. The western ridge is slightly the higher, but the eastern the more interesting. The rock is remarkably sound and solid.

Leaving the motor road at the northwest corner of the second of the Vermilion Lakes, just across a little rivulet, the climber, slanting northwesterly, soon reaches the pine-clad western buttress of the eastern ridge, where the ascent begins. The buttress presents a succession of varied face-climbs all the way. After a thousand feet or so, a small crag is reached, on the top of which, lashed to a stunted tree, waves a storm-worn Union Jack. Across a little dip rises, apparently perpendicularly, the first real pitch, but the going is good and the trees afford excellent anchorage. The ridge, narrowing, ends at the foot of a tower of huge slabs and masses of rock, presenting a sheer wall in front.

"We closed with the wall and presently struck a narrow ledge on the west side of the tower leading slightly upwards. . . . . In a hundred feet or so it ended abruptly at a last stunted pine, thrusting out from a narrow crack like a captive's arm from a high loophole in some castle keep. There was no road but the crack. The pine made a perfectly safe anchor, however, and thirty feet of rope was sufficient to reach another consisting of a fragment of rock jammed into the cleft and overhanging rather awkwardly. Above this the chimney grew easier, and presently the leader's head emerged above the roof."

From this point there was nearly level going for perhaps a quarter of a mile to the foot of the last tower, about forty feet high, and perpendicular, but having a convenient outside staircase sloping up to the left. This ended in a wide chimney, from which one emerged on the summit. Time from road to summit going leisurely about four hours.

Probably the quickest way back to Banff would be to drop over the eastern ridge and make for the Cascade Mountain bridle path but this might mean trouble among the burnt timber. An interesting route for a strenuous party would be to follow the craggy ridge northerly to the col, thence along the western wing and down to the road near the Mystic Lake trail.

Mr. Greenham chose a middle course, starting straight down the west side into the ravine, by the screes. The screes soon ended in crags and gullies which gave some interesting climbing and led to the torrent bed descending from the col to the road.

THE "BLAZE" BY THE WHIRLPOOL RIVER

In his interesting article on "The Whirlpool," in the Journal for 1914-15 (page 84), Mr. G. E. Howard tells of finding an ancient blaze on a tree near his camp pitched not far from the forks of the North and South Whirlpool. Here it is:

J. M.
W. C.
H. A. T.
H. S.
Oct. 20
'53

Probably he thought this an unsolvable mystery but after all a mystery is only a secret revealed to the initiated and we are now initiated.

Mrs. J. A. Wilson, of Ottawa, formerly Miss Tuzo, the well known climber after whom Mt. Tuzo, No. 7, of the Ten Peaks, is named, one of our original members, wrote this spring saying, "I am convinced that H. A. T. is my father who went overland in '53 and would pass about October. He was then a youth and went over with the annual Hudson's Bay party. Sir George Simpson used to offer a post to the gold medallist at McGill and that year it was my father, Henry A. Tuzo."

Through the kindness of Mr. Thomson, of the Hudson's Bay Company, we learned that no record was kept of the personnel of the parties who went west in the early days. The only hope was to look up the register of the "Engaged Servants" for that year. The name Henry A. Tuzo appears in the list of Oregon and West Department Servants for 1853-4—evidently he was engaged in the year 1853. It is probable also that this was his first year of service, as there is no balance carried forward in his account. The other initials probably refer to:

J. M.—James Murray.
W. C.—William Calder.
H. S.—Cannot be traced.

It is interesting to note that the accounts of these three men, H. A. Tuzo, James Murray and William Calder, are each debited with the sum of threepence for postage in 1853.

Who was H.S.?

NEW NAMES

By rulings of the Geographic Board of Canada

The name of the great mountain to the north of Mt. Robson has been decided by the Geographic Board. Miss Jobe called it Mt. Kitchi, Mr. S. P. Fay called it Mt. Alexander after Sir Alexander Mackenzie, the great explorer. It is finally named Mt. Sir Alexander on the analogy of Sir Donald and Sir Sandford.

To obviate confusion, the names of the mountains known as White and Black Douglas have been changed by the Board. The Black Douglas is now Mt. Douglas; the White Douglas is now Mt. St. Bride. St. Bride (or Bridget) was the patron saint of the Douglas family. The mountain was named after David Douglas, the botanist and traveller.

The name of Mt. Edith Cavell for the false Mt. Geikie has been finally established.

Gould's Dome in the Crows Nest region has been changed to Tornado Mountain. The former Tornado Mountain is now Gould Dome.

THE TOBACCO FUND

On New Year's Day an appeal was made to members of the Club in aid of the Overseas Tobacco Fund, which does so much to ease the lot of the soldiers at the front. In spite of the fact that every one is giving generously to the many war funds, the sum of $251.45 was raised and sent to the fund, with cards of greeting which were enclosed in each parcel of tobacco, that the recipient might know it was from the Alpine Club of Canada.

REVIEWS

The Building of the Alps—By T. G. Bonney, D.Sc., F.R.S., etc.*

Dr. T. G. Bonney's masterly work, "The Building of the Alps," has been presented to the Club by Mr. John Brunner. It is a history of the European Alps by one who made them a life-long study, and is a valuable gift.

Although dealing directly with a chain of mountain ranges of a distinctly different geological formation to the Canadian Rockies, a study of it will be found most instructive with regard to the formation of mountains the world over, and of their original construction from the primary folding of the earth's crust; it shows how such folding was gradually carved in to the very striking and wonderful shapes seen in the various mountain regions of the globe.

The first five chapters are more particularly of local significance, but Chapter VI on "The Making and Movement of Glaciers" is a very valuable treatise, applicable to all mountain elevations where glaciers are found. It enables the student visiting the Canadian Rockies intelligently to understand the formation and action of the splendid masses of snow and ice seen there in such abundance, and to comprehend the varied individual features of interest in connection with them, such as, firns or névés, ice structure, snow pock-marks, dirt bands, glacier tables, sand cones, moraines, etc. The description of the making of moulins, giant kettles and roches moutonnées is especially interesting.

Chapter VII contains a discussion of the theories of the old and new schools concerning the making of peaks and valleys, cirques, ridges and passes, and of the respective qualifications of water and ice as the chief constructive agency. The examples quoted are found in the European Alps, but the principles involved apply to every mountain area.

Chapter VIII is of especial interest, owing to its description of the creation of earth-pillars, or "Hoodoos," as they are known in the Canadian Rockies. The reference to caves and underground passages of subterranean streams also finds a parallel, and the discussion of ice-caves or "glacières" describes a feature that is not unknown to Canadian mountaineers.

Chapter IX, dealing with "Avalanches and Floods," strikes a kindred note in its description of the cause and effect of snow-cascades, ice-falls, or rock-falls and mudslides.

Chapter X on "Alpine Meteorology," which deals with atmospheric rarefaction and the consequent effects, more commonly described as mountain sickness, is most interesting. In the same chapter the references to cloud phenomena recall similar examples in the Canadian Rockies. The notes on thunder and electrical storms relate experiences with which our mountaineers are well acquainted, although not in such an aggravated form as the author experienced

*T. Fisher Unwin, London, England and Charles Scribner's Sons, 1912, $3.75 net.

in the Chapel of Cà d'Asti, which must have been a unique and truly terrifying experience.

All the remaining chapters are more directly of local application and complete a history of intense interest and valuable instruction to students of mountains, and particularly of the European Alps.

The many years over which the studies of the various subjects embodied here have been spread and the special scientific and literary qualifications of the author have enabled him to set forth his facts and deductions in a manner that leaves nothing to be desired. Armed with a previous knowledge of the geography of the Alps and of this delightfully instructive work, a visit to the grandly historic mountain region it describes can be thoroughly appreciated and enjoyed.

The volume contains forty-eight reproductions from photographs and sketches by well-known travellers and mountaineers. They serve to illustrate the text most graphically and many are of high artistic value. Several of the most striking are by the late Dr. Tempest Anderson, a life member of the Alpine Club of Canada.

A. O. Wheeler.

Chronicles of the White Mountains—By F. W. Kilbourne*

Assuming as true the dictum of Allen H. Bent in his "Bibliography of the White Mountains," quoted by Mr. Kilbourne in his Preface: "The White Mountains have had more written about them, probably, than any other mountains, the Alps alone excepted," this latest addition to that bibliography, by Mr. Kilbourne, deserves and will undoubtedly win a most important place in the literature of that region. It represents the most complete treatment of the story of human life and endeavour in that little corner of Yankee Land, an area of much smaller extent than the space included in the Big Bend of the Columbia River in British Columbia.

Always paying graceful and ample, but discriminating, tribute to the most notable books that have preceded him, such as Drake's "The Heart of the White Mountains," Starr King's "The White Hills," and the distinctively tourist guide-books, he treats in systematic detail the various phases of the struggle of civilization to gain and maintain a footing in that wilderness, to discover and make available for intellectual, aesthetic and physical enjoyment of mankind the resources of that most attractive region.

His first chapter, devoted, as befits a book of Chronicles in America, to "Indian Legends and History," bids fair in its opening pages to resemble the famous chapter of "Owls" in the "Natural History of Iceland;" for the early civilized settlers among the White Mountains appear to have known little and cared less about the legends and life of their rude neighbors, and so they took but little pains to record what they did know. But three of the Indian chiefs have found a place in literature, and as the mountains Passaconaway, Kankamagus and Chocorua charm us by their beauty and stateliness, so the Indians who bore these names win our regard by the story of their life.

Mr. Kilbourne gives us a graphic account of the early explorers of the "Chrystall Hills," of the obstacles to their progress presented

*Boston: Houghton Mifflin Co.

by the pathless forests to thread, by the rocky walls to climb, by the superstitious fears of their Indian guides, and of the enthusiastic success of Field, of Josselyn, of Dwight and of Belknap, and many in later years, in penetrating the heart of this wilderness. With him we watch the first settlers and their rude cabins and the hardships of their secluded life and we wonder at the spirit and endurance of the Crawfords, the Rosebrooks and the Willeys, whose names figure so prominently in the records of the eighteenth century.

Two chapters tell of the coming of noted American and foreign visitors to the White Mountains and of their published description of what they saw there. One chapter deals with the early hotels and the beginnings of the region as a summer resort. Then a chapter is devoted to the poets and painters who found inspiration in the scenery of the White Hills and got fame by their treatment of subjects discovered there.

Turning to a material side of life, he tells us, in full detail, the story of the roads that made the summit of the highest peak, Mount Washington, accessible to the thousands of tourists who otherwise would never have stood on that noble outlook, and of the various shelters and hotels built on its crown and on the crests and sides and nooks of many of these mountains.

To those who can recall the routes of approach available fifty years ago, his chapter on "The Coming of the Railroads" reads almost like a romance. His pages on "the Scientific Exploration of the Mountains" and his account of the occupation of the summit of Mount Washington by a station of the United States Signal Service presents a line of activity appealing but slightly to the ordinary summer tourist, but eminently worthy of a place in these chronicles. But his "Winter Ascents of Mount Washington and Mount Moosilauke" describes scenery and experiences that are amply suggestive of Alpinism in our Canadian Rockies; while his "Casualties on the Presidential Range" and "Some Destructive Landslides" are sufficiently tragic to produce a wholesome respect for these mountains in one who would trust too much to their sometimes benevolent aspect.

In the chapter on "Early Trails and Path-builders" and "The Appalachian Mountain Club and its work in the White Mountains," he pays a fitting tribute to an organization that has done more than all other agencies to extend a knowledge of that region and make their attractions available to lovers of mountain scenery and life. In this connection it seems fitting to make this criticism on Mr. Kilbourne's treatment of this part of his subject, viz., that he, inadvertently, fails to give full credit for the admirable conduct of Appalachia, the magazine of the Club, to the able management of Prof. C. E. Fay, one of the founders of the Club, probably its most prolific writer on mountaineering matters, and editor of the publication during all but the very earliest part of its existence of nearly forty years.

In one chapter the author deals with the lumber industry in the White Mountains, the consequent peril to the existence of the forests, the establishment of the White Mountain National Trust Reserve and other scenic reservations, the latter mostly the property of the Appalachian Mountain Club.

The volume contains about thirty illustrations, some of them engraved reproductions of somewhat famous paintings of scenery

and incidents, but most of them from photographs of scenery or hotels. There is a clear map of the White Mountain area, showing the water courses, the railroads and the highways, the inhabitated centres and the location, by tiny triangles, of all the more conspicuous summits. This map is repeated at each end of the volume on the inside of the cover and the adjacent flyleaf where it can be most conveniently consulted. The book contains one other map on a small scale, showing the location and comparative extent of the various sections of the White Mountain Forest Reserve.

The volume, a large duodecimo of 432 pages, is printed on unglazed paper, restful to the eye and light to handle, two important considerations for the comfort and convenience of the reader.

F. W. Freeborn.

David Thompson's Narrative of His Explorations in Western America, 1784-1812—Edited by J. B. Tyrrell*

"From time to time God causes men to be born who have a lust to go abroad at the risk of their lives and discover news—to-day it may be of far-off things, to-morrow of some hidden mountain." Of such men was David Thompson, fur trader by chance, geographer and surveyor by right of nature. In these post-Darwinian days, when the descent of a great man is considered almost as interesting as that of pedigree cattle, it is remarkable that nothing is known of Thompson's parents beyond their names. There was a family legend that he was of Welsh descent. Born in Westminster in 1770, when he was seven years old he entered the Grey Coat School. There he seems to have been thoroughly well educated, stress being laid on mathematics and navigation and, evidently from his writing, instruction in the noble English tongue was not forgotten as it too often is to-day. In 1783 the Hudson's Bay Company enquired if the school could furnish it with four boys for the settlements in America. As a result David Thompson was apprenticed to the Company in the following year, and his life's work began.

He sailed from London on the company's ship the Prince Rupert for Hudson's Bay and landed at Fort Churchill, where he spent the winter under Samuel Hearne, from which noted traveller he must have gained both instruction and inspiration. After a few years spent in the routine of the fur trade, he began to keep careful meteorological records, and also, from astronomical observations, located accurately the position of Cumberland House. "Such," says Mr. Tyrrell, the well known geological surveyor, "was the beginning of his long career of geodetic surveying, which was to make him the greatest practical land geographer that the world has produced. Very few men have had the opportunity of exploring the half of a great new continent, and no one else has ever seized the opportunity as David Thompson did. For many thousands of miles . . . it was my good fortune to travel over the same routes that he had travelled a century before, and to take observations on the sun and stars on the very spots where he had observed, and, while my instruments may have been better than his, his surveys and observations were invariably found to have an accuracy that left little or nothing to be desired." It is interesting to note that Thompson's sextant was made by Dolland, a firm still in existence and supplying field glasses to the men in the trenches to-day.

*The Champlain Society, Toronto.

In 1797 Thompson, satisfied that the Hudson's Bay Company would allow his geographical talent no scope, left its service and joined the North-West Company, which was then controlled by men with larger and more progressive ideas. Congenial spirits associated with him in this company were Roderick Mackenzie, a cousin of Sir Alexander and the author of "The History of the Fur Trade," and Simon Fraser, who afterwards descended the Fraser River, and named the Thompson Rivers after his friend.

His first work under the new employer was to determine the position of the 49th parallel of latitude, which had been decided on as the boundary between the United States and British North America. In 1799 he extended his surveys to the Athabaska River and while at Isle à la Crosse married a half-breed girl, Charlotte Small, a marriage which seems to have been in every way happy.

In 1804 the North-West and the X. Y. Companies united their forces and decided to extend the trade into the country west of the Rocky Mountains, spreading over what is now British Columbia, and the States of Idaho, Washington, Oregon and the western portion of Montana.

Time fails to tell of his work. He travelled the Columbia from its source to the sea; he discovered the Howse and the Athabaska Passes; and the source of the Mississippi; he surveyed the International boundary from St. Regis in Quebec to the northwest angle of the Lake of the Woods, and he made a map which is standard to this day. He was a most successful fur trader, a naturalist and a keen student of Indian manners and customs.

In 1812 he went to Montreal and never journeyed west again. At first he seems to have been comfortably off, working on his map and surveying; but latterly he fell on evil days. He lost money, his sons lost money, and then his eyesight went. "He was so poor that he had to sell his instruments and even to pawn his coat to procure food for himself and his family."

He died at Longueuil in 1857 in his eighty-seventh year. His wife and he lie buried in Mount Royal Cemetery at Montreal, without a monument. A great man, too little known, whose work remains.

This edition of the Narrative is published by the Champlain Society. It is needless therefore to say that it is a delight from every point of view. The editing is thorough, the printing is clear, the book lies open and is not too heavy to hold and the illustrations are pertinent. Thompson's map is reproduced on a somewhat reduced scale, and there are coloured reproductions of three of his water colour sketches of the mountains.

S. H. Mitchell.

A Thousand Mile Walk to the Gulf—By John Muir*

This is rather a book for the lover of John Muir than of the mountains or of botany. It is pleasingly written and will help to pass intelligently an idle hour.

In 1867 Muir started on a walking trip from Indiana to Florida, intending to go thence to New Orleans and so to South America,

*Boston: Houghton, Mifflin Co., $2.50.

traverse the untravelled jungle and make his way on a raft down the Amazon to the Atlantic. Fever seized on him in Florida and prevented his completing the wild scheme. Instead he made his way to California which became the home of his heart.

Apparently the ways of men interested him but little. Plants and trees were his friends and humanity but a necessary adjunct. The Civil War had ended two years ago and the country was in an unsettled condition. On his way through the back country Muir, who could not have given the impression of wealth, was several times attacked by roving white men and negroes, but fortunately escaped all hurt. At such a period a man travelling as he did was naturally looked upon with suspicion and householders were not willing to entertain him. The travelling student was not as well known in those days as at present. People were needed on the farms and students were regarded as idlers.

When he reached Savannah he found the expected remittance had not arrived at the Post Office and for a week he lived upon a dollar and a half. This was insufficient even to procure sufficient food, and he bivouacked in the beautiful Bonaventure Cemetery about four miles from the city. He built himself a bower among the bushes, with a roof of rushes and a bed of moss, and enjoyed the company of the squirrels and the birds.

From Savannah he took steamer to Fernandina, Florida. The salt tang of the sea, the rocky coast, recalled his early youth and the neighbourhood of Dunbar and the Bass Rock. The memory evidently haunted him as he records it on several occasions in his diary. "How imperishable," he says, "are all the impressions that ever vibrate one's life! We can forget nothing. Memories may escape the action of will, may sleep a long time, but when stirred by the right influence, though that influence be as light as a shadow, they flash into full stature and life, with everything in place."

Florida was not a disappointment and his first sight of a palmetto was an inspiration. "Whether rocking and rustling in the wind, or poised thoughtful and calm in the sunshine, it has a power of expression not excelled by any plant, high or low, that I have met in my whole walk thus far." And some people find it soulless compared with a spray of northern pine! How different again is the northern forest with its dappled shade. "In the dense Florida forests sunlight cannot enter. It falls on the evergreen roof and rebounds in long silvery lances and flashy spray. In many places there is not light sufficient to feed a single green leaf on these dark forest floors. . . All the flowers, all the verdure, all the glory is up in the light."

The alligator suggests to him that the philosophy of the period, long exploded, that everything is specially created for the benefit of man is neither just nor reasonable. The gospel of Wallace and Darwin had not yet spread over the earth.

After a prolonged attack of malarial fever at Cedar Keys, he made his way to Cuba, one of his "happy dreamlands." Ill-health prevented his penetrating far into the interior of the island, to his great disappointment, but he found much of botanical interest in the immediate neighbourhood of Havana.

Here really ends the journey, but the book continues the account of Muir's wanderings until he reached California and the Delectable Mountains. There his real life's work began.

S. H. MITCHELL.

***Trout Lore—By O. W. Smith**

Perhaps the stories of the fisherman, of all sportsmen, are the pleasantest reading for the ordinary wayfaring man who knows not the art. Our author rightly says, "Every true angler is an embryonic poet, feeling things which he cannot express, seeing things which he cannot describe. He who fishes for fish is not an angler but a mere fisherman." His is the true sportsman's philosophy; a day ending with an empty creel may have held finer sport than that famous experience of Mr. Briggs when they "flew at me, barking like a dog." The line of Herrick sums it up: "It is the fight that crowns us, not the end."

The author starts to "justify trout's way to man," but it is a difficult problem for their ways are variable as an April day. He gives a curious account of a speckled trout he once caught which was a brilliant silver when taken but at night could not be singled out from others in the creel. Those who have seen the herring in the net, brilliant with rainbow hues and the same fish a few hours later, when they are merely silvery white, will understand.

Naturally, there is a chapter on the effect of weather. Every one has his pet superstition, but there are perhaps two misunderstood points mentioned. He differs with Walton in his objection to the east wind. Now Walton spoke of the east wind as he knew it in England coming over the North Sea from the fens of Holland and the cold Jutland moors—raw and cold always. In the United States this does not necessarily follow. Again there is a prejudice against fishing in a thunderstorm, but is this rightly expressed? Our author, like many another fisherman, has had splendid sport when the waves on the loch are high, and the thunder is roaring. Surely the bad time is the hour before the storm, when the air is heavy, and everything seems dead, and the fish sink to the bottom and will not rise, charm one never so wisely.

"Trout are pre-eminently the fly-fisherman's fish." True, but we hear nothing of the "Sea" or "White Trout," which yield as fine sport as any fish that swims. Let him who has fished from a boat or in waders at the mouth of one of those Scottish or Irish streams, where its clear sherry-coloured water—if any one is left who knows what sherry is—mingles with the sea, when the trout are rushing up, bear witness.

"Fish fine and far off" is the golden rule but, like other golden rules, is not easy to follow. For inland streams and in fact generally, the dry fly is to be preferred. "The best short description of the difference between wet and dry-fly fishing is that which describes the first as 'fishing the stream,' and the second as 'fishing the rise'."

Objection has been raised to spinning for trout. Mr. Smith rightly says, "That one method of fishing is in itself more sportsmanlike than another is a fallacy . . . Sportsmanship is the spirit of fair play raised to the *n*th power, a willingness to give and take and keep sweet the while." "The way of a trout with a spinner is as the way of a man with a maid, always different."

The question of tackle and, above all, of flies, is absorbing. It is rather amusing to hear a presumably good democrat state, "It is a good idea to have a few abbeys, coachmen, royal coachmen, and

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*Frederick A. Stokes Co., New York, $2.00.

professors." Of other lures it is well said, "I cannot see how a man violates the ethics of true sport, when he rightly employs" the modern lures. Of course the word "rightly" begs the whole question.

The book includes many valuable hints on tackle and the different branches of angling, including instructions in fly-tying, perhaps one of the most delicate of arts.

The book is full of "pointers" written by a fisherman who loves the game, but it is not one of that annoying class which gives a few recipes and a little gush and calls it a book. The enjoyment is genuine as the knowledge, and the fresh air breathes through it. Surely, however, it is time that a close season was started for some overworked phrases as well as for fish. Many of us are wearied of "'God's Out o' doors," second rate sentiment at the best of times, and hope never to see it again. The art of the angler includes a wise simplicity.

The book is nicely printed and illustrated by commonplace half-tones. A few wood-cuts or etchings giving some of the spirit of the letterpress would have been more effective. A grave fault is the absence of an index.

S. H. MITCHELL.

OFFICIAL SECTION

REPORT OF HEALY CREEK CAMP

The eleventh annual Camp of the Club was held in the Healy Creek Valley, not far from the summit of Simpson Pass, from July 13th to 31st. It was pitched in an open glade, well protected by trees, somewhat similar to the site of the Sherbrooke Lake Camp in 1911. An innovation in the journey to Camp that was much appreciated was the trip by motor launch from Banff up the Bow River to the landing at the beginning of the new trail from the river bank to the old Simpson Pass trail. In future it is probable that many travellers to Mt. Assiniboine and Simpson Pass will arrange for their ponies to meet them at this landing and cut out some miles of trail of no particular interest.

The trail passed the great "hole in the wall" penetrating the mountain opposite Mt. Bourgeau, through which the clouds could be seen scudding over the sky on the other side of the range. This is mentioned by Sir George Simpson, after whom the pass is named, in his "Voyage Round the World."

A subsidiary camp was placed among the larches besides Bill Peyto's Lake, near the summit of Simpson Pass, which commanded a fine view of Mt. Monarch and other peaks, and from which many of the most interesting expeditions started.

Owing to persistent war conditions the Camp was naturally a small one, 82 being placed under canvas. However, the vitality of the Club was maintained, and enthusiasm spread among new members, to whom the secrets of the mountains were revealed.

Those present at the Camp were drawn from the following places:

CANADA

British Columbia: Cameron Lake, Kelowna, Rossland, Sidney, Vancouver, Victoria, Wilmer.
Alberta: Banff, Calgary, Edmonton, Lethbridge, Vermilion.
Saskatchewan: Regina.
Manitoba: Winnipeg.
Ontario: Berlin, Hamilton, Ottawa, Toronto.
Nova Scotia: Windsor.

UNITED STATES

Illinois: Chicago, Galesburg.
Indiana: Lafayette.
Maryland: Annapolis.
Massachusetts: Boston, Brookline.
New York: Brooklyn, New York.
Washington: Seattle.

SWITZERLAND

Interlaken.

There were present members of the English, Swiss and American Alpine Clubs, of the Appalachian Mountain Club, of the Mazamas and the Mountaineers, of the Royal Geographical Society and the Linnaean Society.

THE ANNUAL MEETING

The annual meeting was held at the Camp Fire on the afternoon of July 20th. In the absence of the President and the Vice-Presidents, the Director took the chair.

The address of greeting from the President, Mr. J. D. Patterson, was read, expressing regret at his unavoidable absence, and exhorting members to maintain their loyalty to the Club, which must be preserved in full efficiency until the members fighting on behalf of the Empire return. The President also suggested that the precedent of 1915 be followed and that an appreciative message be sent from the meeting to members on Imperial War Service.

Communications were read from the President, Captain (now Major) W. W. Foster, Mrs. C. H. Mitchell, Dr. N. Collie and Mr. R. Douglas, secretary of the Geographic Board of Canada, expressing keen regret at being unable to be present and great enthusiasm for the welfare of the Club. Mr. Douglas announced that the name of the mountain south of Jasper, erroneously called Mt. Geikie, had been changed to Mt. Edith Cavell.

The Director's report was then submitted, giving an account of the history and standing of the Club during the past year. He detailed the noble work of the members at the front, and urged those at home to stand by the Club and enable it to carry on its good work to the ultimate goal.

The Hon. Treasurer wrote saying that the financial standing of the Club was satisfactory, but that it was important that annual fees should be paid promptly. He stated that since the annual statement was published debentures to the amount of $410 had been returned to the Club.

The Secretary-Treasurer reported the Club's membership as smaller, but stated that new members were coming in and that the enthusiasm was unabated.

The result of the ballot for Officers for the ensuing two years was then announced. Major Stanley L. Jones had been elected President, but, owing to his lamented death through wounds received on active service, the former President, Mr. J. D. Patterson, in accordance with the Constitution, has consented to carry on the office.

A resolution of sympathy and encouragement was passed to be sent to every member engaged on Imperial Service.

A resolution of sympathy with Mrs. Stanley L. Jones was passed.

The meeting expressed its regret at the enforced absence of Professor F. W. Freeborn, who, until his illness prevented him, had been at every camp held by the Club and whose albums of photographs in the Club library, were an abiding joy.

Votes of thanks were passed to the Dominion and Alberta governments for their appreciative financial grants to the Club, which enabled it to carry on its useful publicity work.

The officers of the Club, whether retiring or re-elected, were tendered a hearty vote of thanks for their untiring labours in the service of the Club.

Votes of thanks were also passed to the railway companies for their assistance in the matter of rates, and also to Mr. F. L.

Hutchinson, of the C.P.R. hotel department, for the loan of the Swiss guides.

Captain W. J. S. Walker was tendered a vote of thanks for his great kindness in refurnishing the medicine chests which he had presented to the Club and which were of much service.

A vote of thanks was also passed to the Camp and Club House staff in recognition of their assiduous and unselfish labours.

The meeting then adjourned.

EXTRAORDINARY MEETING

At the request of Colonel C. H. Mitchell, Vice-President of the Club, on service in France, an extraordinary meeting was called on July 27th. It was held at the Upper Camp from the hour of noon until one o'clock to synchronize with one to be held by members at the front.

The occasion was a solemn one. The green alpine meadows stretched on all sides to Mount Monarch, distant Assiniboine and stately Ball rearing its glacier crowned head above Shadow Lake.

The Director presided, stationed in front of the Union Jack. As he spoke of the purpose of the meeting and contrasted the peaceful surroundings with the turmoil of battle, Nature, with that dramatic touch she often shows, sounded Heaven's artillery; the lightning flashed and the thunder roared and echoed among the mighty mountains. After the thunder came a solemn silent space, when for five minutes the members present concentrated their thoughts upon the members on active service at the front.

A motion of sympathy and encouragement was passed and signed by the Director, Secretary-Treasurer, C. A. Richardson as General Manager of the Camp, and by Mrs. C. B. Sissons, on behalf of the ladies.

As the meeting closed the sun shone brightly, the sky was blue and all around was peace.

REPORT ON MOUNTAINEERING AND EXPEDITIONS

Mt. Monarch was the most interesting ascent within comfortable reach. Mt. Brett and the middle peak of the same range were also ascended. Mt. Bourgeau failed to attract.

Excursions radiated in every direction, the most popular being one to Shadow Lake, via Haiduk Pass and returning by the northern shoulder of the Pharaoh Peaks. Shadow Lake is one of the most beautiful of the many beautiful lakes in the Rockies. From its western end the precipices of Mt. Ball rise sheer, the avalanches from the snow-capped crown fall continuously into the lake of peacock blue, and the soft green of the embosoming pines completes the harmony. On the way Egypt and Mummy Lakes were passed. Around the former the alpine flowers were in waves of bloom; the latter, a mountain tarn, showed bleak, barren and lonely.

The professional guides were Christian Jorimann and Christian Hasler. Mr. A. H. MacCarthy brought Conrad Kain with him and placed him at the disposal of the Camp authorities on several occasions.

Fifteen passed the test for active membership. Their names are given on the following page.

Mt. Brett, July 18th
E. G. Ritchie

Mt. Monarch, July 19th
Miss L. McPhedran
Miss E. Watt

Middle Peak, July 20th
Miss A. M. Cross
Miss J. Ellis
W. H. Fernie
C. S. Sheldon

Mt. Monarch, July 21st
Miss E. Anderson
Miss J. M. Hearns
C. G. Wates

Mt. Monarch, July 27th
J. W. Atkins
Miss I. DeBursey
P. R. Brecken
Mrs. M. Frazer

Mt. Monarch, July 28th
Miss K. Robinson

THE CLUB LIBRARY

There have been many additions to the Club library during the year, some of great interest. A list with notes is subjoined.

Mr. F. W. Freeborn, an Original and Life member, has presented the Club with an album of selected views for each Camp attended by him since 1906, when the first Camp was held at the summit of Yoho Pass by the emerald-green waters of the Yoho Lake.

From that first Camp to the end of the Cathedral and Robson Camps in 1913, Mr. Freeborn was a constant attendant and considered it among the greatest joys and privileges of his life to be able to be present at these annual gatherings around the great Camp fire. It was while on his way to attend the Upper Yoho Camp in 1914 that he was stricken by an illness which has since deprived him of the ability to attend and thereby has caused him a life-long regret.

How well we remember the Dean of the New York Corps, with his stalwarts gathered around him in quarters at each Camp, and how keen and enthusiastic they all were under the competent leadership of their chief.

Subsequent to the building of the Club House at Banff, never a year passed without seeing this veteran mountaineer in quarters at No. 5 Tent-house, the highest on the hill, preparing for his summer's campaign in the mountains.

Much as he may regret his inability now to attend the annual Camps, he may rest assured that quite as deep regret is felt by his old comrades, who greatly miss his fine personality as a man and a mountaineer, and his powers of cheery entertainment around the camp fire.

The album is a very valuable presentation as a record of the Camps held within the years mentioned. The photographs selected are all of the choicest scenic beauties presented by the several localities to which they relate, and, perhaps, the most striking feature of the collection is the increased excellence in results from year to year, climaxing at the Cathedral and Robson Camps, the last two attended by Mr. Freeborn.

The many groups of familiar faces that are presented for each Camp give the collection a personal attraction that makes it doubly welcome. The album closes with a number of views of the exterior and interior of the Club House, and of scenic beauties in the vicinity.

As a sample of the alpine attractions of the Canadian Rocky Mountains, it is a truly wonderful collection, and the Club may well express its deep appreciation and sincere thanks to Mr. Freeborn for the camaraderie and kindly feeling that prompted this very valuable gift, to him a work of love.

The usual exchanges have been received. "La Montagne," the Journal of the French Alpine Club, is now published quarterly. We confess to finding the most interesting pages those of "Le livre d'or," containing succinct accounts of their heroes and their work at the war. "L'Echo des Alpes" contains articles of more general interest than formerly. Our American members will be interested in an article on the Adirondacks in the January number. A sentence in the Annual of the Société des Touristes du Dauphiné in reviewing The Alpine Journal somewhat surprises us. Alluding to articles on climbing in remote countries, it says *"Ces exploits lointain ne sauraient nous interesser."* Why should not the inhabitants of the ancient province take an interest in the wide world? We greatly appreciate the gracious references to our Club members on Imperial service which appear in The Alpine Journal and the Scottish Mountaineering Club Journal. These maintain their usual high standing which it were superfluous to praise.

The American magazines contain much of interest. South Africa and Japan send welcome magazines which keep us in friendly touch with those far countries. The Yearbook of the Swiss Club appears again, combining in one the years 1914 and 1915. As usual, it is full of information and beautifully illustrated.

Mrs. A. O. Wheeler kindly gave an afternoon tea service and some flower vases to the Club House; a useful and much appreciated gift.

Mr. H. O. Frind has presented three large framed photographs which now adorn the walls of the Club House and are greatly admired. Mr. Bent has presented a book of photographs of the neighbourhood of Banff and Miss J. L. McCulloch has kindly made up an album of photos of the last two camps, presenting also some cushions and a charming flower basket.

Under war conditions the Club has no resources to expend on the library. It would be very grateful for gifts of books. The Secretary-Treasurer will be glad to give any information about books desired, or whether suggested books have already been presented. Some more book cases to match those already in the library are badly needed. Perhaps a few friends might club together and give a section. Thus the cost would not be very onerous.

The list of additions follows:

Appalachia. Index to Vols. I-X. Donor, Appalachian Mountain Club.

The Book of the Machine Gun. By F. V. Longstaff and A. H Atteridge. Pub. Hugh Rees, London. Donor, Major F. V. Longstaff.
This book may be summed up in one word, "Thorough." Probably for many years to come it will be indispensable to every one interested in gunnery.

The Book of Forestry. By F. F. Moon. Pub. D. Appleton & Co., New York. Donor, LeRoy Jeffers.

A popular book which it is hoped may bring the average man to understand how to use and not abuse the great assets of the forests.

The Boys' Book of Hunting and Fishing, The Boy's Book of Canoeing and Sailing. Both by W. H. Miller. Pub. G. H. Doran Co., New York. Donor, LeRoy Jeffers.

The Building of the Alps. By T. G. Bonney. Pub. T. Fisher Unwin, London, England, and Chas. Scribner's Sons, N.Y. Donor, J Brunner. Reviewed on a previous page.

Camping and Woodcraft. Vol. I. By H. Kephart. Pub. Outing Co., New York. Donor, LeRoy Jeffers.

Touring Afoot. By C. P. Fordyce. Pub. Outing Co., New York. Donor, LeRoy Jeffers.

Equipment for Mountain Climbing and Camping. By A. H. Bent, R. Lawson and P. Sayward. Pub. Appalachian Mountain Club, Boston. Donor, A. H. Bent.

These three books contain advice and many recipes of varying value for campers. The last, a booklet of 28 pages, contains much information in short compass and will appeal more to mountaineers than the other two.

The Canada Year Book. Pub. King's Printer, Ottawa. Donor, P. A. Taverner.

Chronicles of the White Mountains. By W. F. Kilbourne. Pub. Houghton Mifflin Co., Boston and New York. Donor, LeRoy Jeffers. Reviewed on a previous page.

The Complete Mountaineer. By Geo. D. Abraham. Pub. Methuen & Co., London. Donor, J. W. A. Hickson.

The author disclaims the possibility of completeness, but his book is a valuable storehouse of information, written in the characteristic Abraham style, and generously illustrated from fine photographs.

In Canada's Wonderful Northland. By W. T. Curran and H. A. Calkin. Pub. G. P. Putnam's Sons, London and New York Donor, LeRoy Jeffers.

A somewhat diffiuse account of a trip made in 1912 from Missinaibi, Ontario, to Hudson's Bay and along its eastern shore to Clarke Island, with the object of investigating the natural resources of the country. Minerals, pulp, wood and water power are the most important finds, and, in the neighbourhood of James Bay, some excellent agricultural land.

5,000 Facts About Canada. By Frank Yeigh. Pub. Canadian Facts Pub. Co., Toronto. Donor, the Author.

Mt. Rainier. Edit. by E. S. Meany. Pub. Macmillan Co., New York. Donor, LeRoy Jeffers.

A series of articles which would form valuable foundations for a book on Mt. Rainier. What such a book may be Guido Rey's "Matterhorn" shows. A map of the mountain and its surroundings would have been more valuable than the portraits of the various authors.

Wild Flowers of the N. American Mountains. By Julia W. Henshaw. Pub. Robert M. McBride & Co., New York. Donor, the Author

An enlarged edition of the former issue, illustrated by beautifully tinted plates as well as half-tones.

Peaks and Precipices. By Guido Rey. Pub. T. Fisher Unwin, London. Donor, J. W. A. Hickson.
Reviewed Can. Alpine Journal, Vol. VI. Page 242.

David Thompson's Narrative of his Explorations in Western America. Edit. J. B. Tyrrell. Pub. Champlain Society, Toronto. Purchased. Reviewed on a previous page.

Rambles in the Vaudese Alps. By F. S. Salisbury. Pub. E. P Dutton & Co., New York. Donor, LeRoy Jeffers.

Sport, Travel and Adventure. By A. G. Lewis. Pub. T. Fisher Unwin. Donor, Mrs. H. J. Parker.

A Thousand Mile Walk to the Gulf. By John Muir. Pub. Houghton Mifflin Co., Boston. Donor, LeRoy Jeffers.
Reviewed on a previous page.

Trout Lore. By O. W. Smith. Pub. F. A. Stokes Co., New York. Donor, LeRoy Jeffers. Reviewed on a previous page.

Twenty Years in the Himalaya. By C. G. Bruce. Pub. Edward Arnold, London. Donor, J. W. A. Hickson.

Woodcraft for Women. By Kathrene G. Pinkerton. Pub. Outing Co., New York. Donor, LeRoy Jeffers.
A series of chapters on camp life, written from the feminine point of view, not a treatise on woodcarving, as the name might imply. Like most handbooks, which profess to introduce the novice to wild life, it will be found much more valuable as an appendix to a first experience than as a primer. There is much discovery of the obvious, such as "Waders should be carried if there is any necessity of wading." There are also many valuable hints, but the fact remains that a week in the open, with a skilled packer or "guide," teaches more to an intelligent pupil than a wilderness of books.

PAMPHLETS

Geographical Distribution of Vegetation of the Basins of the Rivers Eden, Tees, Wear and Tyne. By F. J. Lewis. Donor, the Author.

On Induced Variations in the Osmotic Pressure and Sodium Chloride Content of the Leaves of Non-Halophytes. By F. J. Lewis. Donor, the Author.

The Sequence of Plant Remains in the British Peat Mosses. By F. J Lewis. Donor, the Author.

The Plant Remains in the Scottish Peat Mosses. By F. J. Lewis Donor, the Author.

Faunas of Canada. By P. A. Taverner. Donor, the Author.

Recent Mountaineering in the Canadian Alps. By Chas. E. Fay Donor, the Author.

The Squirrels, Chipmunks and Gophers of Colorado. By R. B. Rockwell. Donor, The Colorado Mountain Club.

Trail and Timberline. Donor, The Colorado Mountain Club.

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